

UNIVERSITÉ DE GENÈVE
INSTITUT UNIVERSITAIRE DE HAUTES ÉTUDES INTERNATIONALES

**INFLATION AND DEVALUATION
IN LESS DEVELOPED COUNTRIES,
THE CASE OF THE PHILIPPINES.**

Thèse présentée à l'Université de Genève
pour l'obtention du grade de docteur ès sciences politiques

par

NGUYEN ANH NGA
— (Viêt-Nam)

Thèse n° 300

Clausthal-Zellerfeld
Böneck-Druck

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NGUYEN VAN NGA

THÈSE DE 3^{ème} AN

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La Commission mixte, composée des Doyens des Facultés de droit, des lettres, et des sciences économiques et sociales, et du Directeur de l'Institut universitaire de hautes études internationales, sur le préavis du Professeur Alexandre SWOBODA, de M. Hans GENBERG, chargé de cours, et de M. Cyrus SASSANPOUR, Visiting Research Associate, autorise l'impression de la présente thèse, sans entendre par là exprimer d'opinion sur les propositions qui y sont énoncées.

Genève, le 15 décembre 1977

Pour la Commission mixte :
Jacques FREYMOND
Directeur de l'Institut universitaire

Thèse No 300

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INFLATION AND DEVALUATION IN LESS DEVELOPED

COUNTRIES : THE CASE OF THE PHILIPPINES

Contents

	Page Number
INTRODUCTION	1
CHAPTER I INFLATION	3
I.1 Inflation in a closed economy	3
I.1.1 Keynesian theories of inflation	3
a) Demand-pull	
b) Cost-push	
I.1.2 The monetary approach to inflation	6
a) The dynamics of inflation	
b) Stopping inflation	
I.1.3 Some notes on Less Developed Countries	13
I.1.4 Costs of inflation and growth	14
a) Keynesian redistributive-allocative effects	
b) Inflation tax	
I.2 Inflation in an open economy	23
I.2.1 General considerations	23
I.2.2 The monetary approach to inflation in an open economy	26
I.2.3 A monetary model with expectations	29
CHAPTER I INTERNAL AND EXTERNAL BALANCE	52
II.1 Introduction	52

		Page Number
II.2	The fiscal-monetary policy models	55
II.2.1	General features	55
II.2.2	Internal and external balance in less developed countries	55
II.3	Growth and the domestic economic policies	59
II.3.1	The neoclassical monetary growth models for a closed economy	59
II.3.2	Economic structure and economic policies of less developed countries	65
II.4	Growth and the balance of payments	77
II.4.1	Trade and development	77
II.4.2	Balance of payments policies	83
	a) Exchange rate policies	
	b) Arguments for trade restrictions	
CHAPTER	III DEVALUATION	96
III.1	A review of the theory with special considerations of less developed countries	97
III.1.1	The elasticity approach	97
III.1.2	The absorption approach	102
III.1.3	The income approach, a synthesis of the elasticity and the absorption approaches	104
III.1.4	The monetary approach	105
III.2	Devaluation and the price level	116
III.2.1	The income approach	116
III.2.2	The monetary approach	120
III.3	Devaluation and trade controls	124
III.3.1	The concept of the shadow exchange rate	125
III.3.2	Trade controls and the effect of devaluation on the price level	

			Page Number
CHAPTER	IV	THE CASE OF THE PHILIPPINES : GENERAL SOCIAL AND ECONOMIC SURVEY	132
	IV.1	Historical and social survey of the Philippines	132
	IV.1.1	Historical background	132
	IV.1.2	The modern political organization	133
	IV.1.3	Social structure	135
	IV.2	Structure of the Philippine economy	139
	IV.2.1	General economic survey	139
	IV.2.2	The pattern of foreign trade	147
	IV.2.3	The money and capital markets	151
	IV.3	The apparatus of economic policies of the Philippines	154
	IV.3.1	Economic institutions	154
	IV.3.2	Fiscal system	156
	IV.3.3	Monetary instruments	159
	IV.3.4	Foreign trade policies	163
CHAPTER	V	THE CASE OF THE PHILIPPINES : EMPIRICAL STUDY OF INFLATION AND DEVALUATION	167
	V.1	Inflation in the Philippines	168
	V.1.1	A general analysis of inflation in the Philippines	168
		a) Some general indicators	
		b) Inflation and growth	
		c) The monetary approach to inflation	
	V.1.2	An econometric model of inflation in the Philippines	185
	V.2	The balance of payments problem	194
	V.3	Stabilization and devaluation	196
	V.3.1	Stabilization policies	196

	Page Number
V.3.2 The two devaluations and their effects	200
a) The dynamics of devaluation	
b) Devaluation and resource allocation	
CONCLUSION	213
APPENDIX I	215
APPENDIX II	220
APPENDIX III	221
BIBLIOGRAPHY	224

I N T R O D U C T I O N

In economics, as in other social sciences, one may or may not adhere to a theory, one may be an enthusiastic follower, or an even more enthusiastic opponent of a given theory. Although one theoretical proposition cannot gain unanimity around it, it is preferred to the mere description of the facts, which can offer no plausible explanation. But then, the follower of a theoretical proposition is left with the fearful task of convincing the wavering people (and hopefully the opponent?) by producing the proof that this proposition is empirically validated. His task is greatly facilitated by the tools of econometrics and , sometimes, simply by the observation and interpretation of actual economic data.

In our present study, we propose to examine the problems of inflation and of devaluation in less developed countries in the light of different existing theories. In our view not any one theory is to be completely rejected, for each theory contains "one part of the truth", but some theories are not complete. This uncompleteness stems from the neglect of the economic role of money. In our attempt to find out the causes of inflation in an open economy, we shall build up a theoretical model, in which money is incorporated as one of the essential elements. The procedure which we shall follow can be illustrated as being a "(pseudo-) scientific" one : forming hypothesis in the first step and proceeding to their verification or rejection through experimentation in a second step.

Inflation is one of the serious economic problems that most less developed countries (and developed countries as well) must face in present days. If the causes of inflation can be identified, then this problem can be more effectively tackled. In relation with inflation, devaluation is also under

study for two reasons. One of the causes that lead to inflation, namely an increase in domestic credit, can also lead to a deficit of the balance of payments; in this respect, devaluation is considered as one of the remedies of the deficit. But in turn, devaluation is a cause of the increase in domestic prices.

The following dissertation is divided into five chapters, which are linked together by a coherent sequence. The first three chapters will treat the problems of inflation and devaluation on the theoretical level and will consider the case of less developed countries in general; they will serve as a background and a framework for the empirical study of the case of the Philippines, which will be scrutinized in the last two chapters. The choice of the Philippines derives from practical reasons : the Philippines offer good and relatively reliable statistics, compared to other less developed countries. The Philippines are also a typical open less developed economy, in the region of South-East Asia, in which we are interested.

CHAPTER I

INFLATION

This chapter is concerned with the theory of inflation in a closed and in an open economy, with its special implications for less developed countries (LDC).

I.1. Inflation in a closed economy

We shall give here a brief survey of the principal theories of inflation in a closed economy, with their sets of remedies to inflation. Before discussing any theory or "model" of inflation, let us first define inflation as a "sustained rise in the general price level". This definition excludes the case of a temporary rise in prices in some sectors of the economy, due to climatic, natural or other specific causes.

Broadly speaking, we can distinguish between two theories of inflation, the Keynesian approach and the monetarist approach. The Keynesian approach can be further divided in two main versions, the "demand-pull" and the "cost-push" inflations, each one depending on the specification of institutional factors.

I.1.1. The Keynesian theories of inflation

A comprehensive survey of inflation theory, with special stress on Keynesian approaches, is given by M. Bronfenbrenner and F.D. Holzman in their

article : "Inflation Theory : A Survey" , American Economic Review, 1963.
Our work here consists in concentrating on the main features of the different theories and in pointing out the method of correcting inflation that they implicitly lead to.

a) The "demand-pull" version

The "demand-pull" version puts the emphasis on the inflationary gap : inflation is due to the excess over the supply of real output. The idea can be simply illustrated by the Keynesian "cross-diagram" as follows :

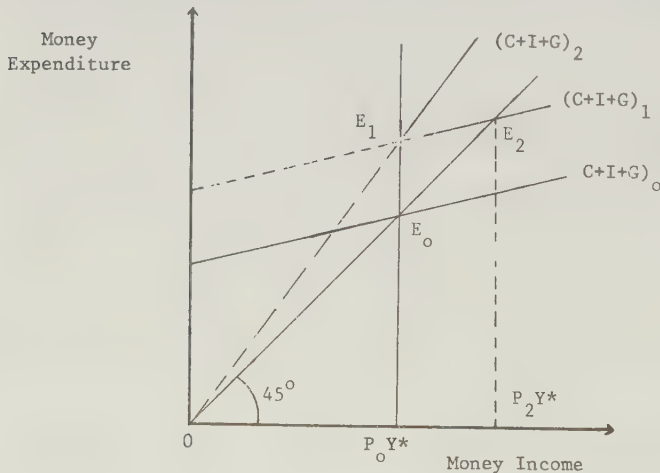


FIGURE 1

On the vertical axis is plotted money expenditure, which is the sum of private consumption (C) , investment (I) and government expenditure (G) . On the horizontal axis is plotted money income, which is the product of the price level and real output (PY). The "45°-line" determines the locus of points where money income is equal to money expenditure. Before full-employment income Y^* is reached, every increase in expenditure induces

a rise in real income, by the multiplier process; beyond the full-employment line $P_0 Y^*$, real output is constant, hence any increase in expenditure entails a rise in the price level.

Suppose that from the full-employment equilibrium point E_0 , for some reasons or others (e.g. an exogenous change in the saving habits of the public), expenditures are increased from $(C + I + G)_0$ to $(C + I + G)_1$ or $(C + I + G)_2$, creating thus an inflationary gap equal to $E_0 E_1$. This inflationary gap will trigger a process of rise in the price level, which can be stable as in the case of $(C + I + G)_1$ or unstable as in the case of $(C + I + G)_2$. Whether stability is achieved or not depends on several factors: real-balance effect, money illusion, progressive taxation, lags or redistribution of income. Underlying this model, there is an implicit assumption of an accommodating supply of money to finance the excess spending.

b) The "cost-push" version

In the "cost-push" version the exogenous inflationary shock is given by an autonomous increase in the wage rate or in the price administered by the monopolistic firms. Therefore the existence of cost-push inflation presupposes an uncompetitive labor or product market dominated by strong unions or some powerful firms. Many economists criticize this version on the grounds that it ignores the rational behavior of the firms (in maximising profits) and of the unions (in maximising employment).

The inflationary process of this kind is based on an "income-inflation" model: different income groups engage in a struggle for income shares by asking a higher money income. If the higher money income obtained by one group or another is not justified by an increase in labor productivity or in capital productivity, prices will rise. The process of price increase is stable if some income groups accept to loose to the benefit of other groups, if there is money illusion, or if unemployment is sufficiently increased by inflation so that the income groups loose their power to

sustain their claims. Once again, to permit a prolonged inflation of the "wage-price spiral" kind, one has to assume that the government has to finance these price increases to preserve the level of employment.

The distinction between the "demand-pull" and the "cost-push" analyses is interesting in the fact that each approach calls forth a different remedy : the first approach recommends first of all fiscal restraint policy, and eventually tight monetary policy by increasing interest rates or by credit rationing (this assumes that the money supply influences the economy only by the interest rate mechanism). The second approach appeals to wage and price controls to stop inflation. Both recommendations neglect the role of the money supply in generating or in stopping inflation.

1.1.2. The monetary approach to inflation

Contrary to the income-expenditure approach, the monetary approach gives a direct role to the money supply in affecting the economic activity. The monetarists support their view by showing a stable demand for money¹⁾, that is the demand for real money balances is a function of a few variables, namely permanent or current real income, expected rate of change of the price level and the interest rate, the two last factors representing the opportunity costs of holding real balances.

a) The dynamics of inflation

The basic concept is that the price level is determined by the interaction of the supply of nominal money and the demand for real balances.

1) The fact that the demand for real balances is stable seems to be general whether the economy is developed or underdeveloped. See : Joseph O. Adekunle : "The Demand for Money : Evidence from Developed and Less Developed Economies" , IMF Staff Papers, Vol. 15, 1968, p. 220-265 .

The monetary authorities determine the nominal stock of money, but the public ultimately determines the stock of real balances it wants to hold, thus changing the price level.

Empirical findings²⁾ have shown that a high rate of monetary expansion leads to high velocity of circulation (or low stock of real balances) and high nominal rates of interest in the long run; but in the short run the higher rate of monetary expansion induces a higher stock of real cash balances and lower nominal interest rates. The long run high level of nominal interest rates is explained by the anticipated rate of inflation, following Irving Fisher, while the short run phenomena are interpreted as the results of a transitory stock disequilibrium and of lags in the expectations.

To illustrate the dynamics of that process, consider a standard monetary model, allowing for stock disequilibrium in the money market. This model is reproduced from a mimeograph of L. Sjaastad³⁾, but the essence of the stock adjustment mechanism is to be found in Friedman's work⁴⁾. It is

-
- 2) Particularly the empirical works done by : Phillip Cagan : "The Monetary Dynamics of Hyperinflation", in M. Friedman (ed.), Studies in the Quantity Theory of Money , Chicago, Illinois : University of Chicago Press, 1956, p. 25-117; Alfonso C. Diz : "Money and Prices in Argentina 1935-62" in D. Meiselman (ed.), Varieties of Monetary Experience, Chicago, Illinois : University of Chicago Press, 1971, p. 69-162; Arnold C. Harberger : "The Dynamics of Inflation in Chile" in C. Christ (ed.), Measurement in Economics and in Econometrics , Stanford, California : Stanford University Press, 1963, p. 219-250.
 - 3) L. Sjaastad : "Monetary Policy and Suppressed Inflation", unpublished manuscript, 1973. In Sjaastad's paper, the stock and flow disequilibrium model prevails over the present stock disequilibrium model (which is more completely analyzed here), although both models lead more or less to the same results .
 - 4) M. Friedman : "A Monetary Theory of Nominal Income", Journal of Political Economy, Vol. 79, March/April 1971, p. 323-337.

assumed that real output is fixed and that there are only two "commodities" : money and real output.

The model has four equations (all in logarithmic form) :

$$m^d = \alpha_0 - \alpha_1 \pi, \quad m^d = \log \left(\frac{M}{P} \right)^d \quad (1)$$

The demand for real balances (m^d) is a decreasing function of the expected percentage rate of change in the price level (π) .

$$\dot{\pi} = \beta(\rho - \pi), \quad (2)$$

where β = coefficient of expectations

ρ = actual percentage rate of change of the price level

The expectations, as specified by equation (2) , are of the adaptive form.

$$\dot{m} = \mu - \rho, \quad \dot{m} = d(\log M/P)/dt \quad (3)$$

This is an identity relation : the rate of change of the actual stock of real balances ($\dot{m}$) is equal to the difference between the percentage rate of change in the money supply (μ) and the actual percentage rate of change of the price level (ρ) .

$$\rho = \pi + \gamma(m - m^d), \quad \gamma > 0 \quad (4)$$

The last equation is a stock adjustment equation : the discrepancy between the actual and the expected rate of change in the price level is a function of a stock disequilibrium between the demand for real balances and the supply of real balances, and γ is the reaction coefficient.

This model can describe the dynamic process, following a stepwise increase in μ (from μ_0 to μ_1) , starting from a steady state position. Figure 2 can help us to see more clearly the entire dynamic paths of the three variables : ρ , π and M/P .

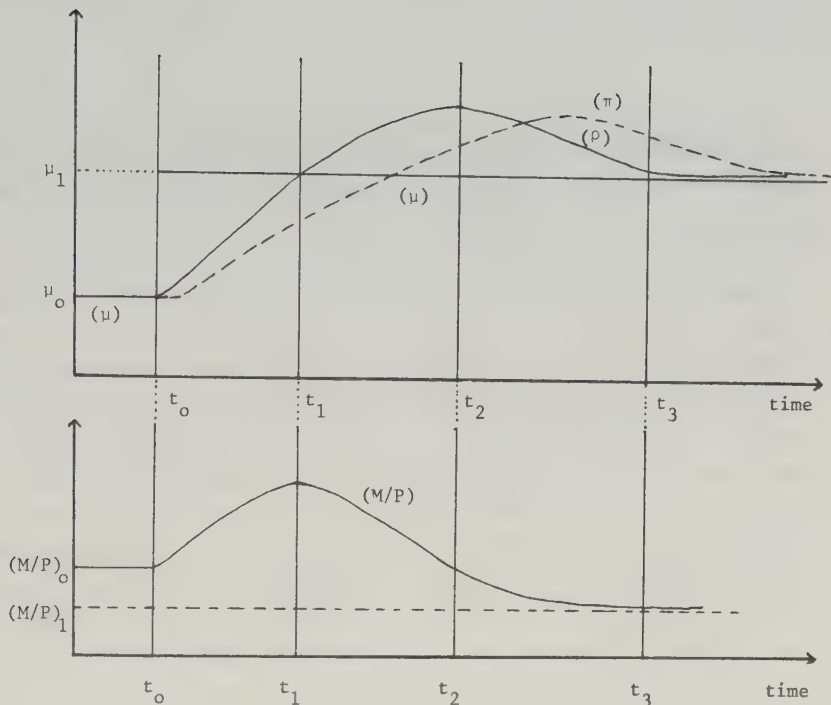


FIGURE 2

At time t_0 , $\rho_0 = \mu_0 = \pi_0$. Then μ jumps from μ_0 to μ_1 and the actual stock of real balance is increasing ($\dot{m} = \mu_1 - \rho_0$), since at the moment of change, the rate of inflation is constant. The public has a perfectly elastic flow demand for money, in the sense that it absorbs all the new money, but it adjusts its behavior only in the presence of a stock disequilibrium. Therefore, from time t_0 to time t_1 , the stock of real balances is increasing, the rate of inflation is increasing but less than the increase in the rate of monetary expansion, and the expected rate of inflation is also increasing¹⁾. At time t_1 , people begin to react to

1) At the moment of change t_0 , $\rho_0 = \pi_0$, hence from equation (2) $\dot{\pi}_0 = 0$; from equation (4), with $\dot{\pi}_0 = 0$ and $\dot{m}_0^d = -\alpha_1 \dot{\pi}_0 = 0$, we have $\dot{\rho} = \gamma(\mu_1 - \rho_0) > 0$. After time t_0 , ρ increases, $\dot{\rho} > 0$, as people adjust their expectations.

the stock disequilibrium in the money market, trying to get rid of their excess stock of real balances by spending more on real goods, and by such doing they will raise the rate of inflation, according to equation (4). The increase in ρ will feed the expectations, as is implied by equation (2), and as the expected rate of inflation is thus increasing, the stock demand for real balances will decrease further, due to equation (1), causing another rise in the rate of inflation, and so on. The process will continue until the stock equilibrium in the money market is restored at time t_3 , with a higher actual and expected rate of inflation ($\rho_1 = \pi_1 = \mu_1$) and a lower stock of real cash balances¹⁾. As the stock of real balances initially increases and then decreases until it reaches its lower new equilibrium value, and as the rate of monetary expansion is increased once and for all, it follows that the rate of inflation is initially lower than the new monetary expansion rate, then it overshoots the latter until finally both are equal. It is important to note that the typical behavior described above is due to the existence of the time lag in the public's adjustment to a stock disequilibrium in the money market and of the time lag in the formation of expectations.

In models of this type²⁾, where the stability of the inflationary process is assured and, thus, the price inflation cannot be self-generating, a sustained increase in the rate of inflation is caused by a sustained increase in the rate of monetary expansion. But why does the rate of monetary expansion increase? An answer is given by the monetarists, who argue that the

1) The model yields the two following differential equations in ρ and π , with μ as the exogenous variable: ($D = d/dt$).

$$[D^2 + \gamma(1-\alpha_1\beta)D + \gamma\beta]\rho = [\gamma(D + \beta)]\mu \quad (1)$$

$$[D^2 + \gamma(1-\alpha_1\beta)D + \gamma\beta]\pi = \beta\gamma\mu \quad (2)$$

As can be verified, the system is stable if $\alpha_1\beta < 1$ and in equilibrium $\rho = \pi = \mu$.

2) See also P. Cagan, op. cit., and Robert A. Mundell: "Growth, Stability, and Inflationary Finance", The Journal of Political Economy, Vol. 73, April 1965, p. 97-109, for similar statements, although the former assumes an instantaneous adjustment in the money market and the latter assumes

government, by expanding the money supply, levies an inflation tax on the public to finance its budget deficit. The real revenue of this inflation tax is equal to $M/P(dP/dt \cdot 1/P)$, where M/P is the base of the tax and $(dP/dt \cdot 1/P)$ is the rate of the tax. According to Cagan¹⁾, the government revenue from inflation is the difference between two elements :

- 1) the real value of new money issued per period of time $(dM/dt) 1/P$
- 2) the change per period of time in the demand for cash balances :
 $-d(M/P)/dt$.

That is : $M/P(dP/dt \cdot 1/P) = (dM/dt) 1/P - d(M/P)/dt$.

The monetary authorities set the rate at which they increase the money supply and this rate determines the tax rate through the inflationary process. The "inflation tax" argument also helps to explain hyperinflation : as the base of the tax (M/P) diminishes, probably more than proportionally to the increase in the tax rate, at the end of the inflationary process, the government increases further the money supply to keep their real revenue constant.

b) Stopping inflation

When we come up to the delicate problem of stopping inflation, the importance of the role played by the lags in adjustment and in expectations is highlighted. It is not easy to design an appropriate policy to reduce the rate of inflation, because we must now take into account the effects of the reduced rate of monetary expansion on both the demand for and the supply of real output. Present economic knowledge does not allow us to

1) P. Cagan, op. cit.

determine exactly what time paths real output and the price level would follow, in response to exogenous shocks. We must therefore rely upon the adjustment and the expectations lags to grope for the effects of a monetary contraction on real output and the price level.

First, on the side of the demand for output, as the dynamics of the above monetary model have shown, there is a lag in the adjustment to a stock disequilibrium in the money market. It follows that an abrupt and discrete drop in the rate of monetary expansion will produce, in the first periods, a less than proportional decline in the rate of inflation. Hence, the stock of real balances will decrease first, implying increased nominal spending relative to income, but at the final steady state, when the decline in the rate of inflation will be exactly equal to the reduction in the growth rate of the money supply, the stock of real balances will be increased. Therefore, the desired reductions in the rate of inflation and in the level of spending induced by monetary restraint, will take place with a lag, which is more or less long depending on the speeds of adjustment in the money market and in the price expectations. There is also the question of the timing of the contractionary monetary policy : if it happens at such time as the one between t_1 and t_2 of Figure 2 , that is during periods where the effects on the rate of inflation of the preceding monetary expansion have not yet completely worked out, it is possible that the rate of inflation will continue to rise.

Secondly, the effects of money reductions on the supply of real output are undoubted. First, the deflationary effect will induce a contraction in the production of output. In addition, a shrinking volume of credit or stock of real balances will deprive the firms of a part of the necessary working capital, and, hence, the firms are forced to reduce their activity, even though the demand will not decrease in the first periods.

Apart from these purely monetary processes, if any recognition of the role of wages in determining the price level is made, inflationary expectations included in the money wage claims of the workers may strengthen the result

that any stabilization effort will entail a decline in real output first, before any reduction in the price inflation is obtained. In fact, if price expectations are based on past performance of inflation, the workers would not accept any cut in the money wage unless prices have fallen for some time.

Thus, the most probable result of an abrupt money reduction is that real output begins to fall first, before any decline in the rate of inflation has occurred. Any monetary stabilization policy, which has as objective a rapid and substantial reduction in the rate of inflation, must face the possibility of a large depression, without obtaining immediate desired effects on the rate of inflation. The case is strong, then, for a gradual tapering-off of the rate of expansion of the money supply. Stretching the time required for price stabilization will be less harmful for the producers of real output.

1.1.3. Some notes on less developed countries

On a priori grounds, the three explanations of inflation are all consistent with the economic structure of LDCs. To begin with the excess demand version, the existence of an inflationary gap is associated with an excess of investment over saving. What we see in LDCs is a growing population with a low per capita income, sometimes near the subsistence level. This situation creates increasing excess demand pressures on the economy, given the existence of some rigidities on the supply side and given the inability of savings to increase much, because of the low level of income.

On the cost-push side, a particular cost push on inflation can arise from the special form of fiscal policy adopted by the governments in LDCs. The fiscal policy in those countries rests more on indirect taxation and on the tariffs raised on imports than on direct taxation. This situation is due to two principal reasons : first, the low per capita income doesn't allow a large base for a direct income taxation, and, secondly, the weakness of

the government apparatus explains, in part, the inefficiency of the fiscal authorities in collecting the taxes and in preventing fiscal frauds.

Finally, as we just have seen, the inability of the governments to rely more on fiscal means to finance their expenditures induces them to use money to cover their budget deficit. Thus, the inflation problem in LDCs is not a simple one, and, at first sight, it constitutes a vicious circle : the very character of underdevelopment creates a favorable environment for inflation, which, in turn, can worsen the underdevelopment conditions. I dare to venture a guess that to break the circle, the LDCs need an inflow of external savings, but, most of all, they must proceed to a profound reorganisation of the economy in a way to improve the use of physical resources and human capacities, to the extent that managerial and technical progress is more amenable to develop a country's productive capacity than an increase in the capital stock. Obviously, this is only a humble personal opinion, since the roads to economic growth are still mysterious and unknown.

Whether money, used to finance the government budget deficit, is the true source of inflation, as is claimed by the monetarists, or money is only accessory to the inflationary process generated by excess-demand-pull or cost-push, as is implicitly implied in the Keynesian approaches, its role in inflation cannot be denied. Therefore, some reduction in the money supply must accompany any measure to stop inflation. The necessity to stop inflation derives from its costs and this consideration leads us to the next section.

I.1.4. Costs of inflation and growth

The arguments for inflationary means of development also derive from a Keynesian analysis, on one hand, and from a quantity theory analysis, on the other hand. However, if inflation can bring about, but in some small proportion, an increase in the growth rate, at the same time, it can impose

heavy costs on the economy. In some situations, the costs of inflation weigh more in the balance and even erase the advantage of an inflation-induced growth.

a) Keynesian redistributive-allocative effects

It is often contended that a mild inflation¹⁾ can help the full employment of resources : it serves to encourage a slackening demand and/or to mobilize the factors of production. This view is supported by the Phillips curve, which is an empirical statement of the trade-off between the rate of inflation and the rate of unemployment.

The mechanism by which output can be increased by inflation in the Keynesian system rests on the income redistribution effects of inflation. These redistributive effects depend on two factors : the inability to foresee inflation and the inability to adjust. There is first a redistribution of income from the "passive" group of the population (fixed-income earners) to the "active" group in general (workers and entrepreneurs), because of the inability of the former to adjust their income in the face of inflation. In a second round, inflation redistributes income in favor of the business firms, whose profits are raised, at the expense of workers, whose wages tend to lag behind prices in a demand-pull inflation, and also at the expense of the creditors, because the nominal rate of interest tends to lag behind the rate of inflation. The outcome of this income redistribution is an encouragement for investment.

However, the redistributive effects as an argument for an inflation-induced growth are only valid in the case of an unanticipated inflation, otherwise

1) A.C. Harberger has proposed a rate of 10% for LDCs. See : A.C. Harberger : "Some Notes on Inflation" in Werner Baer and Isaac Kerstenetzky (ed.), Inflation and Growth in Latin America, Homewood, Illinois, Richard D. Irwin & Co., 1964, p. 319-351.

they involve a serious social upheaval. Inflation can be unanticipated by certain classes of population (wage earners and lenders of funds), if it is relatively mild (some call it a "creeping inflation"), or if it is in its early stages. During periods of protracted inflation, it is likely that the expectations of inflation play an important role in the wage bargains and in the fixing of nominal interest rates on old and new loans, so that the real values of wages, pensions and yields on loans remain constant.

In addition to the social inequalities that inflation may create, inflation or the expectations of inflation also result in economic distortions, which can impede economic growth. The distortions that already exist in the saving and investment sectors because of the specific conditions of underdevelopment are further aggravated by inflation. It is generally recognized that an underdeveloped economy is often subject to a high degree of uncertainty; the economic uncertainty is due, for example, to fluctuations of income derived from export receipts. In addition, the imperfect capital market in LDCs is characterized by an insufficient number of banking or other financial institutions, which can efficiently mobilize savings funds and allocate them among the most productive investments; moreover, the capital market is not homogenous, in the sense that there exist an "unorganized" sector, along with an "organized" one. All this contributes to the lack of information on the best opportunities for investors and savers. Imperfect knowledge, high degree of uncertainty, consequently, induce the investor and the saver to be a risk-averter. The result is the exaggerated importance of self-finance, of small-scale investment projects with short period of gestation.

Inflation can worsen the picture described above by increasing uncertainty and the "liquidity risk"¹⁾. The result is a shift from financial assets to physical assets in a first round, and a shift from investments with high

1) See : A.S. Shaalan : "The Impact of Inflation on the Composition of Private Domestic Investment", IMF Staff Papers, Vol. 9, July 1962, p. 243-263.

marginal efficiency of capital to investments with low marginal efficiency of capital, in a second round. Inflation makes money and fixed-return financial assets, in their function of store of value, less attractive. Therefore the public changes the composition of its portfolio by increasing the proportion of physical assets in its wealth holdings. Furthermore, among the increased physical assets held by the public, there is a strong inclination toward inventory purchases, because inventories can be easily and rapidly sold and because inflation increases the uncertainty related to the profit returns of fixed assets. In fact, during periods of inflation, the prices of different types of goods and services don't adjust at the same rate; the disparity in the speeds of adjustment creates an uncertainty about the future development of relative prices, and hence about the profit opportunities. The failure to predict accurately the future course of relative prices leads the entrepreneur to stop or postpone costly growth-producing innovations or improvements in the production process and to prefer low risk bearing investments (small scale and short period of gestation investments, of which inventories are the most representative), which don't necessarily provide a high marginal efficiency of capital.

The shifts away from productive investments are still strengthened by deliberate government policies to "cure the symptoms of inflation but not the causes of inflation"¹⁾ by imposing certain price controls. Beyond the question of the effectiveness of these discriminatory price controls, which can be rendered useless by the existence of black markets, a misallocation of resources will probably result. For example, price controls on foods will reduce the profit of the producers and hence discourage the agricultural activity (which is the most important sector of the economy of LDCs). Rent controls, associated with the bias toward physical assets, will encourage people to buy house for self occupancy and to spend in luxury housing.

1) Shaalan , op. cit.

b) Inflation tax

As was mentioned earlier, the quantity theory regards inflation as a tax on cash balances : income is thus redistributed from money holders to others. The government can use the whole or part of this inflation tax to finance development. However, the government revenue derived from the inflation tax is balanced against the welfare cost or the "collection cost" of the tax imposed to the public by the substitution of real resources for money.

The argument is strongly based on the existence of a stable demand for real balances. Money can be considered as a consumption or a production good and, as such, yields a flow of utility or a flow productivity. Therefore, a reduction in the holdings of real balances induces a welfare loss which arises from the increased frequency of purchases and payments, involving a tendency towards barter transactions and, hence, loss of time, extra accounting costs, loss of working capital and the like.

Most of the literature on inflation tax limits their analysis to the steady state¹⁾, where inflation is perfectly anticipated (and, hence, the expected rate of inflation is equal to the actual rate of inflation), in order to distinguish the collection cost of the inflation tax from the Keynesian redistributive-allocative costs of inflation which mainly stem from uncertainty. In equilibrium, after full adjustment to the inflation produced by the money issue, the demand for real balances is equal to the supply of real balances, and both are equal to the actual stock of real balances :

$$(M/P)^d = (M/P)^s = (M/P).$$

Now, let the demand for real balances be a function of the rate of inflation,

1) The steady states correspond to the situations indicated in Figure 2 by time t_0 and t_3 .

and of real income (we neglect the effect of real interest rate on the demand for real balances and the effect of the rate of inflation on the rate of growth of real income) :

$$(M/P)^d = f(y, \rho)$$

Taking the time derivative of the logarithm of this function, we have :

$$\mu = \rho + \eta_{my} \lambda$$

where

$$\mu = \frac{1}{M} \frac{dM}{dt} , \quad \lambda = \frac{1}{Y} \frac{dy}{dt} , \quad \rho = \frac{1}{P} \frac{dP}{dt} , \quad \eta_{my} = \frac{\partial (M/P)}{\partial y} \cdot \frac{y}{(M/P)}$$

If money is a fiat, non-interest-bearing money issued only by the monetary authorities - thus, excluding any bank deposits - , the total revenue in real terms that the government gets is equal to the real value of the rate of monetary expansion and is the sum of the revenue from the inflation tax and the revenue from real growth :

$$R = \frac{1}{P} \frac{dM}{dt} = \frac{M}{P} \mu = \frac{M}{P} (\rho + \eta_{my} \lambda)$$

where η_{my} = elasticity of the demand for real balances with respect to income.

In the case of a stationary economy, with no growth in real income ($\lambda = 0$) , the government revenue is equal to the product of the stock of real balances by the rate of inflation :

$$R = \frac{M}{P} \left[\frac{1}{P} \cdot \frac{dP}{dt} \right]$$

The real stock of money is the base of the tax and the rate of inflation is the rate of the tax.

But, then, an interesting question arises : how can we determine the rate of inflation which produces the maximum government revenue ? This can be solved by differentiating the government revenue R with respect to the rate of inflation and setting this derivative equal to zero. For a non-growing economy, the optimum rate of inflation is the rate at which the inflation elasticity of the demand for real balances is unity¹⁾. For a growing economy, Friedman²⁾ has found that the revenue-maximizing rate of inflation is generally lower than for a stationary economy and may even be negative.

To illustrate the government revenue and the welfare cost of inflation, we take the example of a non-growing economy. The following diagram shows the demand curve for real balances. The height of this curve at any point measures the marginal flow of services per unit of time rendered by the marginal unit of real cash balances. In equilibrium, the marginal flow of services must be equal to the marginal "capital loss" incurred by the holding of a unit of real balances (otherwise, there is no holding of real balances). In turn, the marginal capital loss is equal to the rate of inflation, which is the rate at which real balances are depreciated. Thus the area under the demand curve over a segment of the horizontal axis measures the flow of services derived from the indicated quantity of real balances.

1) P. Cagan, op. cit. ; Martin J. Bailey : "The Welfare Cost of Inflationary Finance", The Journal of Political Economy , Vol. 64, April 1956, p. 93 - 110.

2) M. Friedman : "Government Revenue from Inflation", The Journal of Political Economy, Vol 79, August 1971, p. 846 - 856.

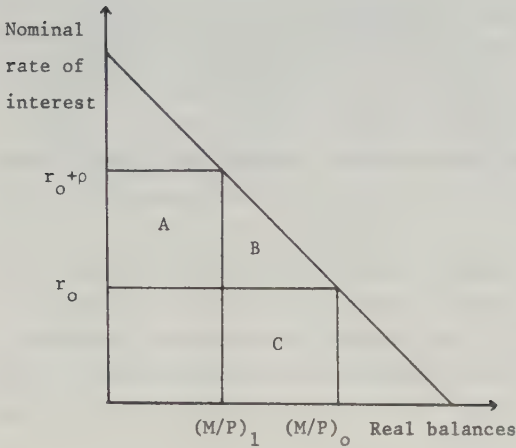


FIGURE 3

In Figure 3 the demand for real balance is a function of the nominal rate of interest (i), where :

$$i = r_0 + \rho$$

r_0 = the (constant) real interest rate

ρ = the fully anticipated rate of inflation

At a zero rate of inflation, $(M/P)_0$ stock of real balances is held, at a rate of inflation equal to ρ , a reduced amount $(M/P)_1$ of real balances is held. The government revenue is equal to the rectangle A and the welfare loss is equal to the sum of the areas B and C (which are the integration of the demand curve over the segment $((M/P)_0 - (M/P)_1)$).

Some interesting numerical calculations are done by several authors.

First, Bailey¹⁾, using a demand function for real balances of the Cagan's type : $M/P = e^{-\alpha p}$, has found, for an imaginary country, that the maximum desirable rate of inflation is 10% a year, at which rate the government will secure about 6% of national income, and the collection costs is of the order of 7% of the amount collected (Bailey has assumed that 7% is the maximum collection cost that a country can afford).

Friedman²⁾, using the same Cagan's demand curve and assuming that $\alpha = 10$, has found that the optimum rate of inflation is 10% for a non-growing economy, 8% for an economy with no increase in real income but with 2% as the population growth rate. If 5% is the rate of growth of real income, the optimum rate of inflation is 3% for an income elasticity of the demand for real balances equal to unity and -2% for an income elasticity equal to 2.

Mundell³⁾, for his part, has concentrated his analysis on an inflation-induced growth. Assuming that the government spends all its inflation revenue in financing investment, and assuming that the velocity of money is a linear function of the rate of inflation, under the best conditions, inflation rates of over 50% per year are necessary to add 1% to the growth rate. But, the real conditions could be worse, in the sense that the government generally does not spend the whole of its revenue in investment financing, but spends an important part of it in current expenditures.

In conclusion, the picture is not bright for an inflationary finance of development. In some cases, the costs involved are so high that the rational policymaker cannot permit the continuation of too high a rate of inflation. Furthermore, if we drop the assumption of a closed economy, inflation induces additional costs for an open economy, insofar as the equilibrium of its balance of payments is threatened.

1) Bailey, op. cit.

2) Friedman, op. cit.

3) R.A. Mundell : "Growth, Stability, and Inflationary Finance", op. cit.

I.2. Inflation in an open economy

I.2.1. General considerations

The openness of an economy raises two important questions. First, what are the effects of internal inflation on the external position of the country ? Second, what is imported inflation and through what channels is inflation imported ? Both questions are related to the fulfilment of an additional objective for the policy maker, namely the equilibrium in the balance of payments, and the answers to these questions are important for the implementation of the stabilization policies of the government.

To analyze the effects of domestic inflation on the balance of payments, we must first define the balance of payments, which, for simplicity, consists only of the balance on current account, neglecting, thus, the capital account. If we take the balance of payments as an entity by itself, it is, then, equal to the difference between exports and imports (here expressed in domestic currency units). However, the balance of payments is but one sector of the whole economy, and, thus, is related to the aggregate activity of the economy. This can be seen in the national income accounting and in the consolidated account of the banking system.

The national income account can be summarized in this form :

$$C + S + T = C + I + G + (X - IM)$$

where :

C = consumption expenditures
S = domestic saving
T = tax payments
I = investments expenditures
G = government expenditures
X = exports
IM = imports.

If we define income as $Y = C + S + T$ and adsorption as $A = C + I + G$, it follows that the balance of payments is equal to : $B = X - Im = Y - A$.

Next, the identity between assets and liabilities of the monetary sector tells us that the total money supply must equal the sum of foreign assets (foreign exchange reserves) and domestic assets :

$$M = R + D$$

where :

M = the money supply
R = foreign exchange reserves
D = domestic credit.

The rate of change in M is identified as hoarding, and the rate of change in R is nothing but the balance of payments. Thus, as Mundell¹⁾ has pointed out, the balance of payments can be equivalently defined as the difference between exports and imports, or the difference between income and adsorption, or the difference between hoarding and credit creation :

$$B = X - IM = Y - A = dM/dt - dD/dt$$

This synthetized definition of the balance of payments helps us in depicting the causes of balance of payments deficit which can be :

- 1) either an exogenous "structural" factor : that is, exogenous shifts in the demand and supply schedules of imports and exports,
- 2) or an excess domestic credit creation, used to finance an excess absorption over income and/or a "cost-push" inflation.

The second set of causes is of importance for us, since it determines the links between domestic inflation and balance of payments. Excess spending induces a deficit in the balance of payments, because the residents

1) R.A. Mundell : "The Balance of Payments", chapter 10 of : International Economics, London : Macmillan, 1968, p. 140 - 151.

consume more export goods (domestically produced) and import goods. This is the primary effect, which depends on the importance of the foreign sector in the economy and the marginal propensity to import. A secondary effect occurs when excess spending on domestic goods increases the price of those goods, relatively to the price of foreign goods. The increase in the relative price of domestic goods will induce a further rise in imports, which is greater, the higher the elasticity of substitution of import goods for home goods; in addition exports may decrease.

As for the "cost-push" inflation, it increases the relative price of domestic goods and its effect on the balance of payments is the same as the secondary effect of excess spending analyzed above.

The monetary approach to the balance of payments, which will be treated in some detail below emphasises the temporary character of the increase in domestic relative prices, because of the monetary mechanism of balance of payments adjustment.

The second problem of concern is the problem of "imported" inflation. Inflation can be "imported" through a balance of payments surplus or a direct cost-push induced by the increase in foreign prices. The first effect is a liquidity effect : as the monetary base of an open economy consists of domestic and foreign assets, a balance of payments surplus will increase the foreign assets and, then, the money supply, in the absence of neutralization policies. The second effect is a direct price effect, which can be transmitted more or less rapidly, depending on the importance of the nontraded goods sector . The increase in foreign prices will increase the price of imports, which in turn will increase the price of exports, to the extent that imports enter in their production and to the extent that the rise in foreign prices will induce the foreigners to raise their demand on home exports (assuming full employment in the domestic economy). The increase in the price of traded goods, relatively to the price of non-traded goods, will entail a switch of consumers towards non-traded goods and thus will increase their price.

1.2.2. The monetary approach to inflation in an open economy

The main message of the monetary approach is that a monetary world with fixed exchange rates is equivalent to a closed economy with a single common currency¹⁾, and hence the world stock of money (which is the sum of the stock of reserves and the stock of domestic credit of all countries) determines a unique world price level, or more specifically, within a growth context, the rate of inflation in the world economy will be determined by the rate of world monetary expansion relative to the world rate of real economic growth²⁾. A small country, with an insignificant share in the world monetary economy, has no influence on the world price level or interest rate; furthermore, by international competition, it must conform to this unique world price level or world interest rate. Hence any attempt by the small country to use monetary policy³⁾ to stabilize its price level (or income level) or interest rate at a level different from the world level has only a temporary success in the short run, and at the cost of neutralizing the effects of its monetary policy on the balance of payments.

1) H.G. Johnson : "Secular Inflation and the International Monetary System", The Journal of Money, Credit and Banking, Vol. 5, February 1973, p.509-519

2) In the dollar-exchange standard, where the role of dollar as a reserve currency is predominant, world inflation is particularly sensitive to inflationary policy followed by the US, witness the acceleration in the world rate of inflation in the late 1960s., which was to a large extent due to the need of financing the unpopular war in Viêt Nam.

3) Many works have concentrated on the short run efficiency of monetary policy, but little is said on the fiscal stabilization policy. A parallel between fiscal and monetary policy is made by Johnson in : Inflation and the Monetarist Controversy, Amsterdam, North-Holland Publishing Co., 1972. In his work, on p. 88 - 89, we read : "... if a country maintains its fixed exchange rate but tries to stop inflation by the usual methods of fiscal and monetary restraint, it is highly likely to wind up with the worst possible of results, unabated inflation combined with

The short run efficiency of monetary policy in stabilizing the economy is reduced by the international mobility of capital and is strengthened with the size of nontraded goods sector⁴⁾.

As in the case of a closed economy, the monetary approach to the balance of payments takes the existence of a stable demand for money as a point of departure. But in contrast with a closed economy, where the monetary authorities control the nominal quantity of money and the public fixes his desired stock of real balances, the interaction between the two magnitudes determining the price level, in the case at hand, namely in an open economy with fixed exchange rate, the public determines his desired demand for nominal balances, and any excess of the nominal supply of money over the demand entails a balance of payments deficit, because the public adjusts to this excess supply by exporting money. Thus, in the long run the money supply becomes an endogenous factor, since it has to exactly satisfy the public's demand for money. The monetary authorities have no control on the money supply as a whole; all that the Central Bank can do is to choose the proportion of money supply that has to be backed by domestic assets or foreign assets. Thus one can conceive the role of the Central Bank as,

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- 3) unemployment of men and productive capacity. The corollary however it should be noted, involves a modification of the model for the short run application of it, since the assumption of perfect international mobility of goods and capital implies that neither fiscal nor monetary policy can exercise any influence over aggregate economic activity : all that fiscal policy can do in abstract principle is to determine the size and composition of government expenditure and the proportion of it financed by debt, and all that monetary policy can do is to determine the aggregate amount of bank credit (...) and, depending in policy, who gets the benefit of it."
- 4) See : A.K. Swoboda : "Monetary Policy under Fixed Exchange Rates : Effectiveness, the Speed of Adjustment, and Proper Use", Economica, Vol.40 1973, p. 136-154; A.K. Swoboda : "Equilibrium, Quasi-Equilibrium, and Macroeconomic Policy under Fixed Exchange Rates", Quarterly Journal of Economy, Vol. 86, February 1972, p. 162-171.

first, to estimate the economy's demand for money, secondly, to set a balance of payments target, defined as a given desired rate of change in foreign exchange reserves, and then to adjust the domestic credit to those two predetermined variables.

A few words must be added with respect to policies followed by LDCs, which can be identified as a sort of cycle between trade controls and devaluation, followed by complete liberalization of foreign trade. This "cyclical" phenomenon can be explained in the light of the monetary approach : as we have noted earlier, an excess burden is put on monetary policy, interpreted as an increase in domestic credit, to finance development in LDCs. This creates a balance of payments deficit, that the government tries to finance by external debt or to prevent or eliminate by trade controls. External debt and trade controls cure only the "surface" of the problem, but not its roots, namely the excess domestic credit. Thus, as the latter goes its way, an ever increasing dose of external debt or trade controls is required to solve the balance of payments deficit; this continues up to a point, where the government cannot afford to use these methods any longer and is compelled to devalue its currency, sometimes in a drastic proportion, and liberate partly or wholly the foreign trade, until the balance of payments deficit appears once again, as excessive domestic credit expansion is not or cannot be eliminated¹⁾.

1) This analysis does not imply that the balance of payments problem experienced by LDCs has exclusively a monetary source. The "structural" cause of balance of payments deficit may be important in some cases and policies other than the reduction in domestic credit creation (among which trade controls) are needed to restrain the excess of expenditures over income.

I.2.3. A monetary model with expectations

In this section we shall illustrate the problem of inflation in a small open economy with the aid of a monetary model, which is a disequilibrium model and whose main characteristics are the distinction between the stock and the flow money markets and the existence of an expectations factor in the stock demand for money. The model allows an analysis of the short run and the long run effects of a change in the foreign price level (or a change in the exchange rate) and of a change in domestic credit. The model will determine the role of expectations in the short run adjustment of the stock of reserves and of domestic price level to a change in the foreign price level (or a change in the exchange rate); it will also trace out the time path of these two variables.

In anticipation of Chapter III, the problem of devaluation, which can be assimilated to that of an imported inflation (i.e. an increase in the foreign price level), will be analyzed here. It will be found, in accordance with the "monetary approach" to the balance of payments that :

- 1) a devaluation leads to a temporary improvement in the balance of payments, but to a permanent increase in the stock of reserves (at least in domestic currency); however, the expectations effect, specially as introduced by the present model, can induce an initial worsening of the balance of payments, before any improvement takes place;
- 2) a devaluation increases the domestic price level (here defined as the price level of exports and non-traded goods).

Moreover, an increase in domestic credit deteriorates the balance of payments and raises the domestic price level in the short run. The influence of the domestic credit and of the foreign price level on the balance of payments and on the domestic price level operate through the real balance effect, which is the adjustment by the public to a discrepancy between the desired stock demand for money and the stock supply of money, and through the expenditure functions. In addition, expectations,

incorporated in the desired stock demand for money, can have a temporary short run influence, but they disappear in the steady state.

This section will be divided into two parts. The first sub-section will sketch the analytical model, while in the second sub-section some data centered on the two devaluations of the Philippines in 1962 and 1970 will be used in an attempt to corroborate the theoretical results with facts.

a) The analytical model

This is a one-country, three - "commodities" model. The assumptions inherent to the model are the following :

- 1) There exist only three "commodities" : real good X, real good Y and money. Moreover there is an excess supply of good X and an excess demand of good Y within the country, so that good X is exported and good Y is imported.
- 2) For convenience only the domestic demand side of the economy is considered in the analysis. Hence the real supplies $\bar{Q}_x$ and $\bar{Q}_y$ of goods X and Y are assumed to be either constant or exogenous. That is, in particular, the questions of growth, of the responsiveness of the domestic production to price changes, and of unemployment are neglected.
- 3) Furthermore, the foreign real demand of domestic good X is assumed to be either constant or exogenous. The constancy of real exports $\bar{C}_x^f$ may be justified by reference to alleged inelasticity of demand for exports of LDCs .
- 4) The country in question is small, so that it is a price taker for its imports, but, nevertheless, it has the power to change the price of its export goods (and non-traded goods) accordingly with their excess demand. This can be justified on the grounds that, as mentioned above, the foreign demand for exports is inelastic and the elasticity of domestic supply is less than infinite (or equal to zero according to assumption 2)). In the real world this does not look unreasonable, to the extent that most countries are more specialized in their exports than

in their imports.

- 5) International movements of capital are assumed away.
- 6) All the value terms are expressed in domestic currency.

Notations

- C_x, C_y : real consumption of goods X and Y
- $\bar{Q}_x, \bar{Q}_y$: real supply of goods X and Y (exogenous or constant)
- P_x, P_y : domestic price level of goods X and Y
- $\bar{C}_x^f$: foreign real demand of good X (exogenous or constant)
- M : stock of money
- M^d : stock demand for money
- P : general price level
- P^e : short run expected price level
- P^* : long run expected (normal) price level
- R : stock of reserves
- H : outstanding domestic credit

The model

1) The consumer's budget constraint

The ordinary consumer's budget constraint states that money income less money expenditure is equal to hoarding. Taking hoarding as a flow demand for money, the disaggregated version of the ordinary budget constraint gives :

$$(C_x P_x - \bar{Q}_x P_x) + (C_y P_y - \bar{Q}_y P_y) + \frac{dM}{dt} = 0 \quad (1)$$

2) The stock nominal demand for money

Is a function of money income and of price expectations. The first component can be taken as reflecting the transactions motive, while the latter is some form of "speculative" motive. However, as will be seen later, the particular specification of the price expectations function implies that this speculative motive works only in a short run disequilibrium situation, such that in the steady state the stock nominal demand for money is equal to the stock nominal supply of money, and both are equal to a fixed proportion of income ($M^d = M^s = kPy$). Thus :

$$M^d = \alpha(\bar{Q}_x P_x + \bar{Q}_y P_y) + \beta(P - P^e) \quad (2)$$

$$\alpha > 0 \quad \beta > 0$$

3) The flow demand for money (hoarding)

This is a realized flow demand for money or realized hoarding, therefore it is equal to the flow supply of money. This function is based on the usual partial adjustment model, that is the flow demand for money increases or decreases according to whether the desired stock nominal demand for money exceeds or falls short of the stock nominal supply of money.

$$\frac{dM}{dt} = \gamma(M^d - M^s) \quad \gamma > 0 \quad (3)$$

4) The price expectations function

First of all, let us introduce the distinction between short run and long run expectations¹⁾. People are assumed to possess expectations about the trend of the price level, which is the long run normal expected price level

1) This distinction is inspired from a work of Jacob A. Frenkel : "Inflation and the Formation of Expectations", Journal of Monetary Economics, Vol 1, No. 4, October 1975, p. 403-421.

P^* . I further assume that these long run expectations are some form of rational expectations¹⁾. That is people are well informed, so that the long run expected normal price level is the one predicted by the steady state conditions of the entire model (and we shall find that P^* is a fixed proportion of P_y). For the present the determination of P^* is left pending.

Let us now tackle the definition of the short run expected price level, which is relevant for the desired stock nominal demand for money. Since the long run expected price level is "normal", it remains unchanged through time. Any deviation of the current price level P from the long run expected normal price level P^* is reflected in the short run expectations, because people expect that the actual price level P will be corrected, in the future, to conform to P^* . Thus, the short run expected price level P^e is assumed to be equal to the actual price level corrected by an adjustment to any discrepancy between the long run expected normal price level P^* and the actual price level P . If the actual price level P is lower than the long run expected normal price level P^* , people expect that the price level will increase, so that P^e is greater than P . On the contrary, if the actual price level P is higher than the long run expected normal price level P^* , people expect that the price level will decrease, so that P^e is smaller than P .

1) Expectations are said to be rational, when they conform to the predictions of the relevant economic theory. This definition of "rational expectations" is given by John F. Muth : "Rational Expectations and the Theory of Price Movements", Econometrica, Vol. 29, July 1961, p. 315-335. It could be added, to be more precise, that expectations about a variable are rational, if they depend, in the proper way, on the same factors that, according to the economic theory, determine that variable. In the present context, the theory predicts that when the economic system is in equilibrium, the domestic price level is entirely determined by the foreign price level.

In short, we can define the price expectations function as :

$$P^e = P + \lambda(P^* - P) \quad (4)$$

where λ is the speed of adjustment.

Furthermore, in equilibrium $P = P^e = P^*$, i.e. the expectations are static and people expect the current price level to persist. The condition $P = P^e$ (hence $P = P^e = P^*$, according to equation (4)) is necessary for equilibrium, for the simple reason that if the expected price level does not equal the current price level, two alternatives occur : if the expectations turn out to be correct, the actual price level will change, hence it was not in equilibrium ; if the expectations are incorrect, then current behavior is based upon false expectations and hence it will be modified as the expectations fail to be verified.

5) The Balance of Payments

As any international capital movement is assumed away, the balance of payments is here identical to the balance of trade, which is equal to the nominal foreign demand of good X minus the domestic nominal excess demand of good Y :

$$\frac{dR}{dt} = \bar{C}_x^f P_x - (C_y P_y - \bar{Q}_y P_y) \quad (5)$$

6) The money supply

The stock money supply, in terms of domestic currency, is equal to the sum of the stock of international reserves and the outstanding domestic credit. This identity can be written as

$$M^S = R + H \quad (6)$$

Furthermore it must be specified that the country in question does not apply any measure of neutralization, so that the stock of domestic credit is not changed in response to balance of payments considerations.

7) The domestic nominal demand functions for goods X and Y

They are a combination of a substitution effect between goods X and Y and the total nominal expenditure effect. Total nominal expenditure is equal to money income less hoarding. Furthermore, as these demands are realized magnitudes, they must be consistent with the consumer's budget constraint. Thus :

$$C_x P_x = \epsilon P_y - \eta P_x + \theta (\bar{Q}_x P_x + \bar{Q}_y P_y - dM/dt) \quad (7)$$

$$C_y P_y = -\epsilon P_y + \eta P_x + (1 - \theta) (\bar{Q}_x P_x + \bar{Q}_y P_y - dM/dt) \quad (7')$$

If total nominal expenditure rises, the nominal demands for real goods are also increased; therefore the condition that $0 < \theta < 1$ must be imposed. The coefficients ϵ and η represent the substitution effect and appear in equations (7) and (7') with opposite signs because of the budget constraint. In fact, by adding up equations (7) and (7'), it can be checked that those two equations satisfy the budget constraint.

8) The domestic price determination

It was earlier assumed that the country in question can change its domestic price level P_x . Now we further specify that the rate of change of P_x is proportional to the excess demand for good X :

$$\frac{dP_x}{dt} = \delta (C_x P_x + \bar{C}_x^f P_x - \bar{Q}_x P_x) \quad \delta > 0 \quad (8)$$

Equation (8) is the reaction function of the producers : they change their prices proportionately to the size of the divergence between actual and

planned sales, assuming that they had planned to sell the whole of their production. In addition, inventory accumulated during periods of excess supply is assumed to be able to satisfy the entire excess demand in other periods.

9) The general price index

Can be defined as a weighted average of P_x and P_y , with the sum of the weights equal to one :

$$P = \omega P_x + (1 - \omega) P_y \quad (9)$$

Before working out the steady state of the model, let us specify that the exogenous variables are : $\bar{Q}_x$, $\bar{Q}_y$, $\bar{C}_x^f$, P_y , H .

The steady state

To determine the long run expected normal price level, we must now find out the steady state of the model. The steady state is characterized by the equilibrium in the stock money market $M^d = M^s$, and hence zero hoarding. Replacing this condition in equation (8) yields :

$$\begin{aligned} \frac{dP_x}{dt} &= \delta(C_x P_x + \bar{C}_x^f P_x - \bar{Q}_x P_x) \\ &= \delta[\epsilon P_y - \eta P_x + \theta(\bar{Q}_x P_x + \bar{Q}_y P_y) + \bar{C}_x^f P_x - \bar{Q}_x P_x] \end{aligned}$$

The equilibrium solution of the above differential equation is

$$P_x^* = \frac{\epsilon + \theta \bar{Q}_y}{\eta + (1 - \theta) \bar{Q}_x - \bar{C}_x^f} P_y \quad (10)$$

that is, in the steady state, the relative price P_x/P_y is constant.

It must be noted by passing that $\frac{\varepsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f}$ cannot be negative, since

the price level P_x cannot be negative¹⁾. It follows that

$[\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f] > 0$, which as will be seen later, is crucial for the stability of the system.

Hence the steady state value of the general price level is :

$$P^* = \omega P_x^* + (1-\omega)P_y$$

$$P^* = \left(\omega \frac{\varepsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} + (1-\omega) \right) P_y$$

Let

$$\mu = \omega \frac{\varepsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} + (1-\omega) \quad (11)$$

then the long run expected normal price level is :

$$P^* = \mu P_y \quad (12)$$

The working of the model

Substituting equation (7') into equation (5) gives :

$$\begin{aligned} \frac{dR}{dt} &= \bar{C}_x^f P_x - (C_y P_y - \bar{Q}_y P_y) \\ &= \bar{C}_x^f P_x - [-\varepsilon P_y + \eta P_y + (1-\theta)(\bar{Q}_x P_x + \bar{Q}_y P_y - \gamma M^d + \gamma M^s)] + \bar{Q}_y P_y \\ &= \bar{C}_x^f P_x + \bar{Q}_y P_y - \{-\varepsilon P_y + \eta P_x + (1-\theta)[\bar{Q}_x P_x + \bar{Q}_y P_y - \gamma \alpha (\bar{Q}_x P_x + \\ &\quad + \bar{Q}_y P_y) - \gamma \beta (P - P^e) + \gamma R + \gamma H]\} \end{aligned}$$

1) If $\frac{\varepsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} = 1$, therefore $P_x^* = P^* = P_y$; by choosing appropriate units of measurements for $\bar{Q}_y$, $\bar{Q}_x$ and $\bar{C}_x^f$, it is very likely that this coefficient equals unity.

From equation (4) :

$$P - P^e = -\lambda(P^* - P)$$

Finally we get the following differential equation for the stock of reserves :

$$\begin{aligned} \frac{dR}{dt} + (1-\theta)\gamma R = & -P_x [\eta + (1-\theta)(1-\gamma\alpha)\bar{Q}_x - \bar{C}_x^f - (1-\theta)\gamma\beta\lambda\omega] - H[(1-\theta)\gamma] \\ & + P_y \{\epsilon + [\gamma\alpha(1-\theta) + \theta]\bar{Q}_y - (1-\theta)\gamma\beta\lambda(\mu-1+\omega)\} \end{aligned} \quad (13)$$

Now replacing equation (7) into equation (8) yields :

$$\frac{dP_x}{dt} = \delta \{ \epsilon P_y - \eta P_x + \theta \left((\bar{Q}_x P_x + \bar{Q}_y P_y) - \frac{dM}{dt} \right) + \bar{C}_x^f P_x - \bar{Q}_x P_x \}$$

Substituting dM/dt from equation (3) combined with equation (2) yields :

$$\begin{aligned} \frac{dP_x}{dt} = & \delta \{ \epsilon P_y - \eta P_x + \theta (\bar{Q}_x P_x + \bar{Q}_y P_y) - \theta \gamma [\alpha (\bar{Q}_x P_x + \bar{Q}_y P_y) \\ & + \beta (P - P^e)] + \gamma \theta R + \gamma \theta H + \bar{C}_x^f P_x - \bar{Q}_x P_x \} \end{aligned}$$

Recalling that : $P - P^e = -\lambda(P^* - P)$, we finally get the following differential equation for the domestic price level :

$$\begin{aligned} \frac{dP_x}{dt} + P_x [\delta (\eta + (1-\theta)(1-\gamma\alpha)) \bar{Q}_x - \bar{C}_x^f + \beta\lambda\gamma\theta\omega] = & R(\delta\gamma\theta) \\ & + P_y \{ \delta [\epsilon + \theta(1-\gamma\alpha) \bar{Q}_y + \beta\lambda\gamma\theta(\mu-1+\omega)] + H(\delta\gamma\theta) \} \end{aligned} \quad (14)$$

Let : $a = (1-\theta) \gamma$

$$b = \eta + (1-\theta)(1-\gamma\alpha) \bar{Q}_x - \bar{C}_x^f - (1-\theta) \gamma\beta\lambda\omega$$

$$c = \epsilon + [\gamma\alpha(1-\theta) + \theta] \bar{Q}_y - (1-\theta) \gamma\beta\lambda (\mu-1+\omega)$$

$$d = \delta [\eta + (1-\theta)(1-\gamma\alpha)] \bar{Q}_x - \bar{C}_x^f + \beta\lambda\gamma\theta\omega$$

$$e = \delta\gamma\theta$$

$$f = \delta [\epsilon + \theta(1-\gamma\alpha) \bar{Q}_y + \beta\lambda\gamma\theta (\mu-1+\omega)]$$

then we have a system of equations (where $D = d/dt$) :

$$(D + a) R + b P_x = c P_y - a H \quad (13')$$

$$(D + d) P_x - e R = f P_y + e H \quad (14')$$

or in matrix form

$$\begin{pmatrix} D + a & b \\ -e & D + d \end{pmatrix} \begin{pmatrix} R \\ P_x \end{pmatrix} = \begin{pmatrix} c & -a \\ f & e \end{pmatrix} \begin{pmatrix} P_y \\ H \end{pmatrix}$$

The characteristic equation is :

$$D^2 + (a + d) D + (ad + be) = 0 \quad (15)$$

which has the roots :

$$r_1, r_2 = \frac{-(a + d) \pm \sqrt{(a + d)^2 - 4(ad + be)}}{2}$$

The stability conditions are :

$$\begin{aligned} - \text{for the real roots : } \sqrt{(a + d)^2 - 4(ad + be)} &< (a + d) \\ (a + d)^2 - 4(ad + be) &< (a + d)^2 \\ - 4(ad + be) &> 0 \end{aligned}$$

$$\text{since } (ad + be) = \gamma\delta(\eta + (1-\theta) \bar{Q}_x - \bar{C}_x^f) > 0$$

- for complex roots : $-(a + d)/2 < 0$ or $(a + d) > 0$

$$(a + d) = (1-\theta)\gamma + \delta \left[\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f + \theta\gamma\alpha\bar{Q}_x + \beta\lambda\gamma\theta\omega \right]$$

$$\text{since } (\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f) > 0, \quad (a + d) > 0$$

Thus the approach to equilibrium is stable, since the roots have a negative real part, although it could be oscillating.

1) The stock of reserves

The solution of the above system of equations yields a second order differential equation for the stock of reserves as a function of the exogenous variables :

$$D^2R + (a + d) DR + (ad + be)R = [cD + (cd - bf)] P_y - [aD + (ad + be)] H \quad (16)$$

Effects of a change in P_y

Let $P_y = e P_y^f$, where e is the exchange rate, defined as the number of units of domestic currency per unit of foreign currency and P_y^f is the foreign price level of good Y . Therefore a change in P_y is due either to a change in the exchange rate or a change in the foreign price level of good Y or a combination of the two. It is also assumed that the "devaluation gain" in reserves, due to the automatic increase in the domestic currency value of reserves created by the upward adjustment of the unit price of foreign currency, is negligible and is not taken into consideration.

The impact effect of devaluation, before any other adjustment ¹⁾ has taken place in the economy, is given by the coefficient of P_y in equation (13) ²⁾:

- 1) In particular, the adjustment in the domestic price level and in the domestic money supply.
- 2) In the appendix I, it is shown that this coefficient corresponds to the coefficient of DP_y in equation (16).

$$c = \epsilon + [\gamma\alpha(1-\theta)+\theta]\bar{Q}_y - (1-\theta) \gamma\beta\lambda (\mu-1+\omega) \quad (17)$$

There are three components in this impact effect :

- the first is a substitution effect and depends on the elasticity of domestic nominal demands for real goods with respect to P_y ;
- the second component is a "liquidity effect" : devaluation, with constant real income, will raise the money income and, then, the stock nominal demand for money; in a second step, hoarding also rises and money expenditures decrease consequently. This is the well known mechanism, by which the "monetary approach" ensures an improvement in the balance of payments after a devaluation;
- the third component is an "expectations effect" and has a negative sign. Its negative sign is not surprising : if people expect the price level to increase, they will attempt to spend more on real goods, thus worsening the balance of payments (and decreasing the stock of reserves). In fact it could be so high that it would overcome the two first effects, and the impact effect of devaluation on the stock of reserves would be negative. Thus the "expectations effect" introduces the possibility that the stock of reserves initially decreases after a devaluation.

Let us now consider the long run effect of devaluation, when all adjustments are allowed for. Setting $D=0$, this long run effect is given by the coefficients of R and P_y in equation (16) :

$$\frac{cd - bf}{ad + be} = \alpha \left(\frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} \bar{Q}_x + \bar{Q}_y \right) \quad (18)$$

The first striking thing that we can notice is that there is no "expectations effect" in the long run. The relevant factors are the substitution coefficients ϵ and η , the real supplies of goods $\bar{Q}_x$ and $\bar{Q}_y$, the real exports $\bar{C}_x^f$ and the cash-balance coefficient α .

If $\frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} = 1$ (see footnote 1, p.37), the long run effect of

devaluation on the stock of reserves depends on real income multiplied by the cash-balance coefficient.

It is shown in the appendix I that the time paths the stock of reserves could follow after a devaluation can be derived from the solution of the differential equation (16). We obtain three alternatives, which are drawn below, in the case where the adjustment paths are smooth ($t=0$ corresponds to the time when devaluation takes place) :

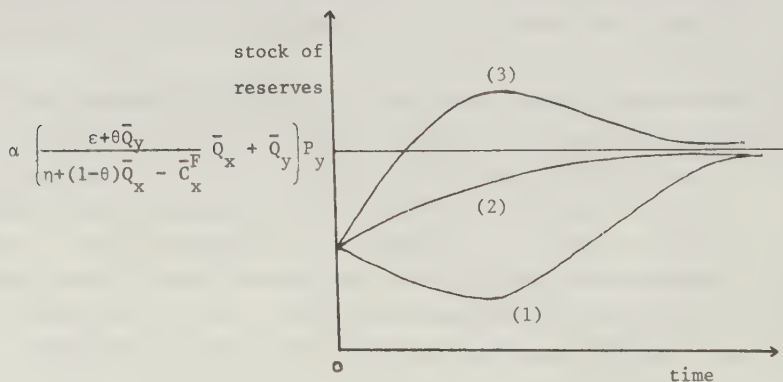


FIGURE 4

Alternatives (2) and (3) correspond to a positive coefficient c and alternative (1) to a negative coefficient c , for c is found to be the slope of the time path of R , when $t \rightarrow 0$.

$$c = \frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} \left[(1-\theta)\bar{Q}_x + \eta - \bar{C}_x^f - (1-\theta)\gamma\beta\lambda\omega \right] + \gamma(1-\theta)\alpha \bar{Q}_y \quad (17)$$

1) $c < 0$: the stock of reserves will initially decrease, then increase up to its steady state level. This alternative has a greater chance to

occur, the higher is the expectations effect $\beta\lambda$.

- 2) $c > 0$ but is small : the stock of reserves will initially increase and keep on increasing up to its steady state level.
- 3) $c > 0$ and is large : the stock of reserves will initially increase so much that it will overshoot its steady state level, but then will reach a maximum and from there will decrease down to its steady state level. This alternative is the more likely, the higher are γ and η . In fact, γ appears in equation (17) simultaneously with a negative and a positive sign; the negative influence of a high value of γ can be counter-balanced by the positive influence of a high value of η , and hence, it remains the positive influence of a high value of γ .

The economic explanation of this phenomenon can be stated as follows : devaluation, by raising the price level P_y , will raise the stock demand for money which, in turn, will raise the flow demand for money; and if the speed of adjustment γ of the flow demand for money is high, the latter will be drastically increased, and thus the expenditures on real goods will be diminished in the same proportion. In addition, if the substitution effect between goods X and Y is high, the expenditures on goods Y will be further decreased and the stock of reserves, consequently, will be largely increased.

However, as the stock of reserves will rise, the money supply will also increase, thus pushing up the level of expenditures and worsening the balance of payments, in consequence, until the stock of reserves reaches its steady state level.

Effect of domestic credit creation

The "monetary approach" applied to a small country predicts that an increase in domestic credit always decreases the stock of reserves by the same amount in the long run. This is true also in the present model. Its impact effect on the balance of payments is $-(1-\theta)\gamma$ and, thus, is greater, the higher the speed of adjustment γ of the flow demand for money.

The long run level of reserves

Setting $D = 0$ in equation (16), we get the long run level of reserves :

$$\bar{R} = \alpha \left[\frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} \bar{Q}_x + \bar{Q}_y \right] P_y - \bar{H} \quad (19)$$

or

$$\bar{R} + \bar{H} = \bar{M}^s = \alpha \left[\frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} \bar{Q}_x + \bar{Q}_y \right] P_y$$

The money supply in the long run is entirely determined by the foreign price level. This fact is once more in accordance with the "monetary approach", which states that the money supply of a small country can be exogenous only in the short run, but is endogenous in the long run¹⁾.

2) The domestic price level

The solution of the system of equations (13') and (14') yields a second order differential equation for the domestic price level as a function of the exogenous variables :

$$D^2 P_x + (a + d) D P_x + (ad + be) P_x = [f D + (af + ec)] P_y + e DH \quad (20)$$

We shall adopt the same procedure as for the stock of reserves to work out the impact and long run effects of devaluation and of domestic credit.

1) See in particular : A.K. Swoboda : "Monetary Policy under Fixed Exchange Rates : Effectiveness, the Speed of Adjustment and Proper Use", op. cit.

Effect of a devaluation

The impact effect of devaluation, before any other adjustment¹⁾ has taken place in the economy, is given by the coefficient

(14) (or equivalently, as shown by the appendix, the coefficient f of $D P_y$ in equation (20)) :

$$f = \delta [\varepsilon + \theta(1 - \gamma\alpha)\bar{Q}_y + \beta\lambda\gamma\theta (\mu-1+\omega)] \quad (21)$$

There are again three components (the sum of which is multiplied by the price reaction coefficient δ) :

- The first component is the substitution effect and depends on the elasticity of domestic nominal demands for real goods with respect to P_y .
- The second component is the "liquidity effect". The effect of devaluation on money demand is represented by $-\gamma\alpha$ and is the only way by which the domestic price level can decrease. If $\gamma\alpha < 1$, it is "devoured" by the money expenditure coefficient θ , so that on the whole the liquidity effect is positive. If $\gamma\alpha$ is high enough, so that $\gamma\alpha > 1$, the liquidity effect can be negative. In fact $\gamma\alpha$ could be so high that the negative liquidity effect would overcome the other two effects, and the impact effect of devaluation on the domestic price level would be negative.
- The third component is the "expectations effect" and is positive. If people expect the price level to increase, they will try to buy more real goods, thus raising the domestic price level.

The long run effect (with $D = 0$ in equation (20)) yields the same result as in equation (10) :

1) In particular, the adjustment in the stock of reserves, and hence, in the domestic money supply.

$$P_x^* = \frac{\epsilon + \theta \bar{Q}_y}{\eta + (1-\theta)\bar{Q}_x - \bar{C}_x^f} P_y \quad (10) . \text{ There is no expectations factor.}$$

Similarly to the case of the stock of reserves, the time paths of the domestic price level P_x can be derived from the solution of the differential equation (20). Also three alternatives are obtained and are reproduced in the following graph in the case where the adjustment paths are smooth ($t=0$ corresponds to the time when devaluation takes place) :

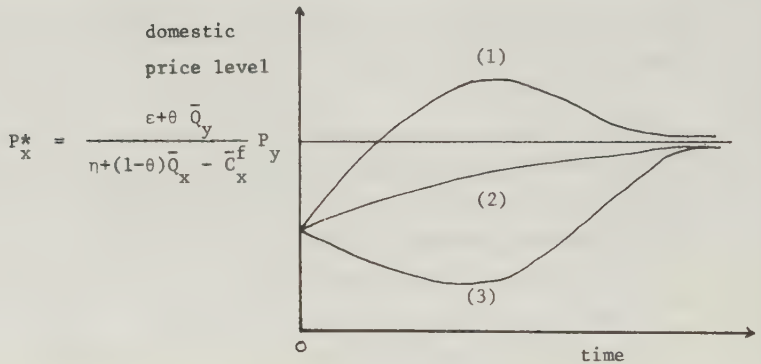


FIGURE 5

Alternatives (1) and (2) correspond to a positive coefficient f and alternative (3) to a negative coefficient f , for f is found to be the slope of the time path of P_x , when $t \rightarrow 0$:

- 1) $f > 0$ and is large : the domestic price level will initially increase and overshoot its steady state level; this implies a turning point from where the domestic price level will decrease down to its steady state level. This alternative is the more likely to occur, the higher is the expectations effect $\beta\lambda$.
- 2) $f > 0$ and is small : the domestic price level will continuously rise until it reaches its steady state level.

3) $f < 0$: the likelihood of this alternative is greater, the higher the speed of adjustment γ of the flow demand for money. This can be explained as in the case of the stock of reserves : devaluation, by raising the price level P_y , will induce a large cut in the expenditures on real goods, through the channels of the stock and flow demand for money. The decrease in expenditures will lower the domestic price level.

And after the money supply is adjusted, via the stock of reserves, the expenditures will increase, thus pushing up the domestic price level until it reaches its steady state level.

We can now draw a parallel between the time paths of the stock of reserves and of the domestic price level. Thus the expectations effect determines the time path No. 1 for both variables, the stock of reserves and the domestic price level : while it decreases reserves, it pushes the domestic price level up. Similarly, the time paths No. 2 and No. 3 of the stock of reserves correspond, respectively, to the time paths No. 2 and No. 3 of the domestic price level : for the case No. 3, the strong liquidity effect induces changes, in opposite directions, in the two mentioned variables.

Effect of domestic credit creation

As can be seen in equation (20), changes in domestic credit has only a short run influence on the domestic price level. In the long run steady state, the domestic price level is entirely determined by the foreign price level¹⁾. The reason is that the increase in domestic credit will be

1) Swoboda, op. cit. p. 144 : "... inflation in the small country is always of the imported type, except in the very short run."

compensated by a balance of payments deficit. In the short run, the increase in domestic credit raises the money stock, which will increase expenditures on real goods, through the flow demand of money. The increase in expenditures will push the domestic price level up and will induce a rise in imports, which, in turn, will worsen the balance of payments. The balance of payments deficit involves an outflow of money and, hence, in the long run, the money stock will return to its initial level.

Returning back to assumptions 2 and 3, from the results stated above, we can see that they are not crucial for the working of the model. A change in the real supplies of goods $\bar{Q}_x$, $\bar{Q}_y$ and/or in the real exports $\bar{C}_x^f$ does not alter the general shape of the time paths. The only consequence is that the magnitudes of short run and long run effects are changed.

For example, let us suppose that the real supplies $\bar{Q}_x$ and $\bar{Q}_y$ are responsive to relative price changes and that there is a rapid reallocation of resources within the country. Thus, when unemployment exists, in the short run, a devaluation will increase the relative price of good Y and therefore induce an increase in $\bar{Q}_y$. It is then likely that the long run level of reserves is higher.

Some final remarks must be made about the model. First, on the technical ground, the procedure followed in the model to trace out the time paths of the endogenous variables is based on the concepts of short run and long run "multipliers" of dynamic models¹⁾, in response to a change in the exogenous variables.

Secondly, what makes the originality of this analytical model is the role that expectations play in the adjustment process. An attempt is made here to contribute to the understanding of the role of expectations, which, until now, have not been incorporated into devaluation theory.

1) See appendix I for the development of short run and long run "multipliers", for a second order differential equation.

So far we have treated the "expectations coefficient" λ and the "speculation coefficient" β as being constants. We now discuss on the problem of the determination of their magnitudes. In what circumstances are they substantial? The general impression that we derive from the study of hyperinflation history is that, at least in hyperinflation situations, λ and β could be very high. From this empirical constataction, I should jump to the following step and say that the higher the rate of inflation (at least when the rate of inflation is increasing continuously, i.e. when there is no sharp increase, followed by a decrease and then an increase in the rate of inflation¹⁾), the higher are the coefficient λ and β .

For several reasons, and among them the inefficiency of the fiscal system²⁾, most LDCs are prone to use monetary policy (in the sense of an increase in domestic credit) to solve their growth and employment problems. This will give rise to domestic price inflation and balance of payments deficit, in a regime of fixed exchange rate. Therefore, as a matter of guess, the more serious is the balance of payments deficit, and the more frequent devaluations have been in the past the more important is the expectations effect after a devaluation, and the stock of reserves would probably follow the time path (1) in Figure 4.

b) The empirical facts

The Philippines devalued their currency twice between 1960 and 1971. The first time was on January 22, 1962, and the size of the devaluation was approximately 70%; the second devaluation occurred on February 21, 1970, this time at a rate near 60%.

1) The variability of the rate of inflation may blur the expectations about the rate of change in prices. This is another aspect of the expectations problem.

2) With respect to the fiscal policy problem in LDCs, see section I.1.3.

I have adopted the following procedure to trace the time paths of the stock of reserves and of the different price level data provided by the International Financial Statistics. I have rearranged the data in such a way that their indices are equal to 100 the very month where devaluation took place. For 1962, the IFS give the monthly data for the whole year, but for 1970, the monthly data on monetary survey are non-existent after June 1970.

Among the price indices given by the IFS, not any one can accurately represent P_y , for in our model, good Y is exclusively imported good; the whole sale price index of home and import goods can though be used as an approximate of P_y . As for the good X , which is a domestically produced good (import-substitute, export and non-traded goods) its price level P_x can be represented either by the general WPI, the CPI, or the wholesale price index of home and export goods.

Chart 1a shows the path of the stock of reserves (net foreign assets, in IFS terminology) and Chart 1b the path of the price levels after the 1962 devaluation. Chart 2a shows the path of the stock of reserves and Chart 2b the path of the price levels, after the 1970 devaluation. In addition, the levels of the stock of reserves for the month preceding the devaluation and for the month where the devaluation occurred are reported in the following table :

	December 1961	January 1962	January 1970	February 1970
Net foreign assets (in millions of pesos)	89	71	-938	-907

We can then see that on January 1962 there was a decrease in the stock of reserves, while on February 1970 there was a slight amelioration in the level of the stock of reserves, relatively to the preceding levels.

In the 1962 experience, the domestic credit lightly decreased until July. The stock of reserves initially decreased, but immediately increased after the second month, and from July until December, it seemed to stay at a stable level. The Wholesale Price Index increased the most, followed by the Index of Wholesale Price of Home and Export goods. The Index of Wholesale Price of Home goods remain constant until May.

In the 1970 experience, the index of the stock of reserves also decreased initially and began to increase only after the third month. Again, the Wholesale Price Index increased the most, followed by the Index of Wholesale Price of Home and Export goods.

In both experiences, the index of the stock of reserves initially decreased, but the drop in this index is sharper for the 1962 devaluation than for the 1970 devaluation. Since on January 1962, the rate of change of the stock of reserves was negative, while on February 1970, it was positive, the sharp drop in 1962 may suggest that the "expectations effect", as stated in the final remarks, is verified.

THE 1962 DEVALUATION

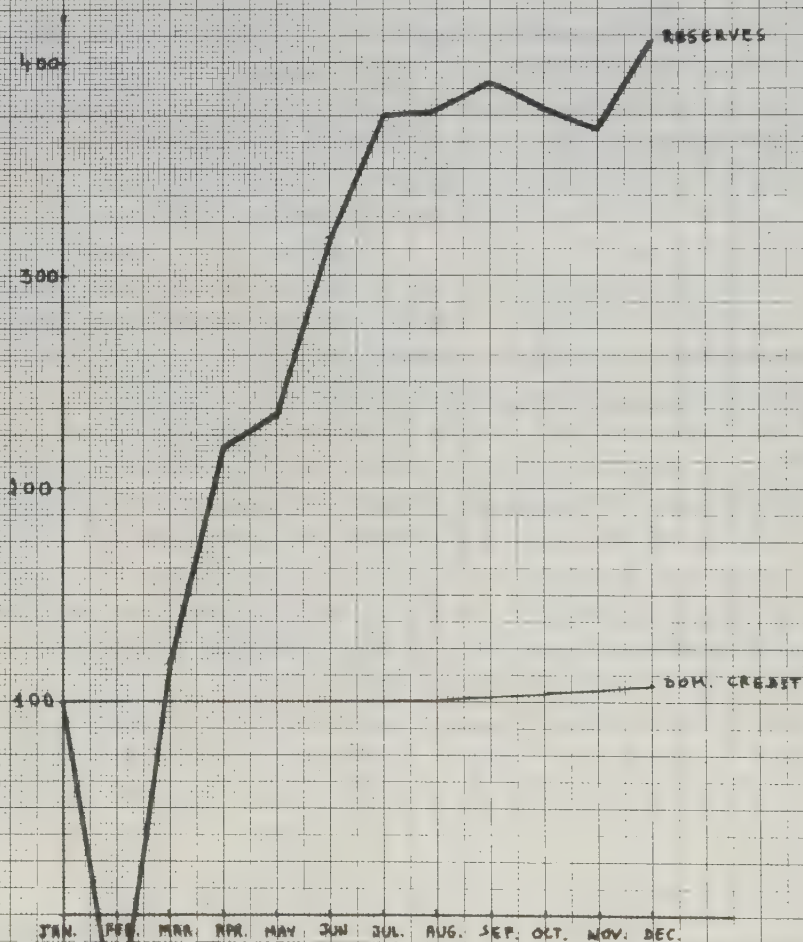


CHART 1a

Indices of the stock of reserves and
of the domestic credit.

THE 1970 DEVALUATION

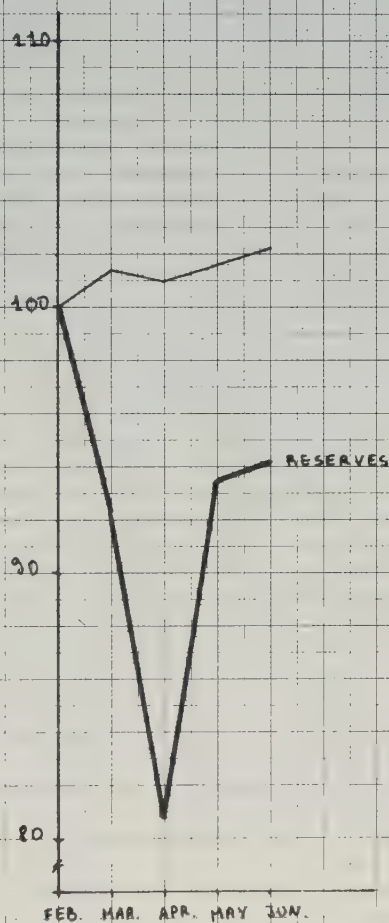


CHART 1b

Indices of the stock of reserves and
of the domestic credit.

THE 1962 DEVALUATION

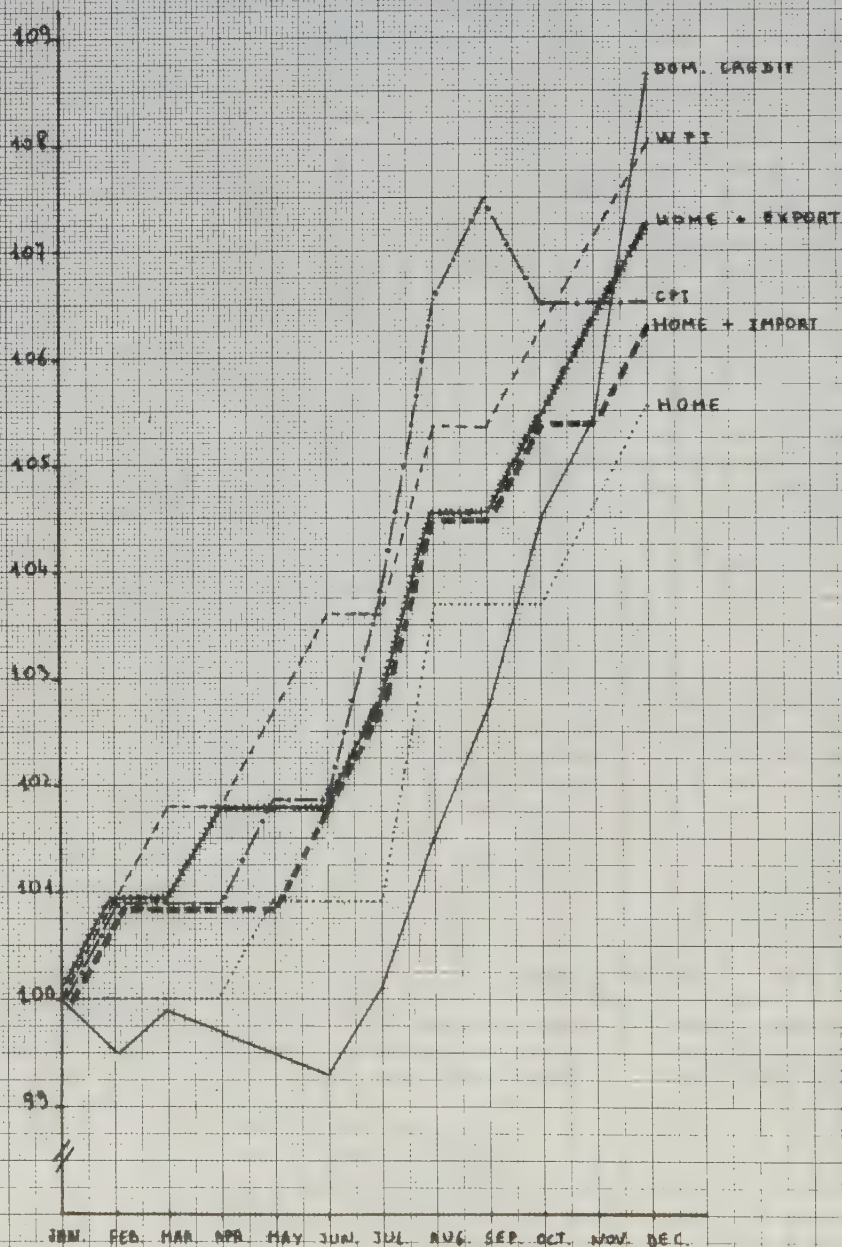


CHART 2a

Indices of the price levels and of the domestic credit.

THE 1970 DEVALUATION

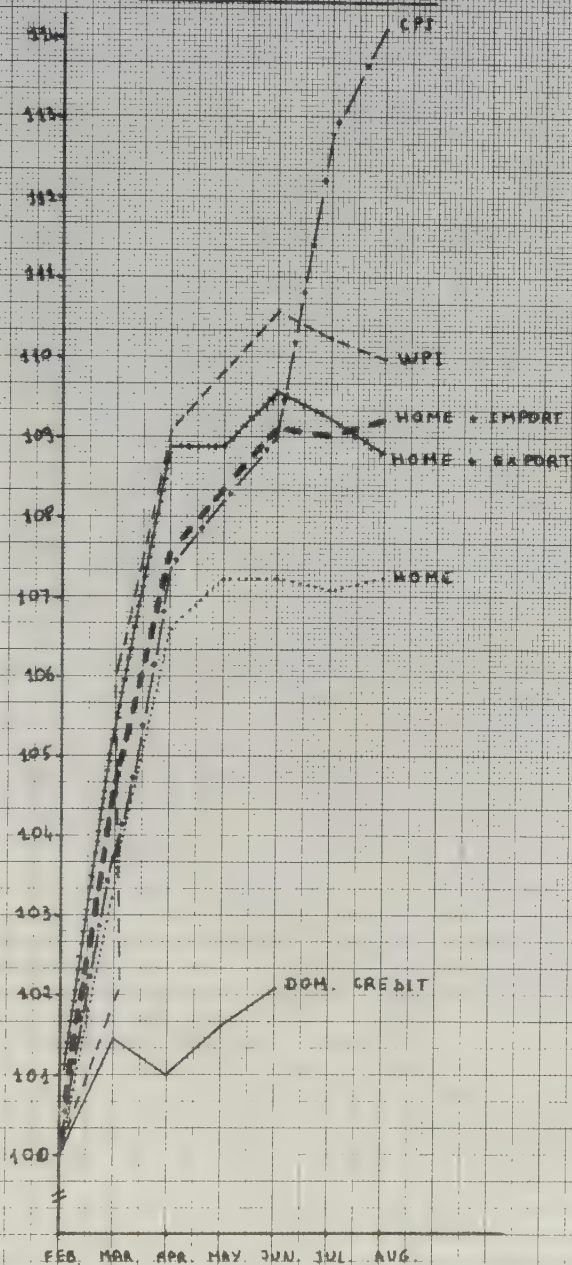


CHART 2b

Indices of the price levels and of the domestic credit.

————— = Index of Domestic Credit

- - - - - = General Wholesale Price Index

+++++ = Index of Wholesale Price of Home and Export
Goods

— — — — — = Index of Wholesale Price of Home and Import
Goods

..... = Index of Wholesale Price of Home Goods

— • — — — • — — — = Consumer Price Index

CHAPTER II

INTERNAL AND EXTERNAL BALANCE

II.1. INTRODUCTION

The openness of the economy and the recognition that the balance of payments is tightly linked to the aggregate activity of the entire economy lead to the identification of two economic objectives : internal and external balance. Internal balance is associated with the attainment of full employment and price stability, and external balance is identified with equilibrium of the balance of payments.

Meade¹⁾ was one of the first writers to treat this problem of double objective and pointed out the possibility of conflicts between the objectives, if only one tool of economic policy is used to achieve both objectives. However, as Corden²⁾ has justly noticed, his error was to arbitrarily tie each policy variable to a specific objective, namely financial policies (defined as the monetary and fiscal policy) to internal balance and exchange rate variations to external balance, neglecting the fact that

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- 1) James E. Meade : The Theory of International Economic Policy, Vol. I : The Balance of Payments (Oxford : Oxford University Press, 1951).
2) W.M. Corden : "Recent Developments in the Theory of International Trade", Special Paper in International Economics, No. 7, March 1965, International Finance Section, University of Princeton.

those policies equally affect both the internal and external situation of the economy.

Mundell added into the analysis the capital account of the balance of payments and the responsiveness of capital flows to interest rate differentials between countries. Mundell¹⁾ concluded that fiscal and monetary policy, under fixed and flexible exchange rates, can be used to attain internal and external balance, provided that the principle of "effective market classification" is respected. Following this principle, the policies should be designed to targets which they influence most directly, for it will ensure that the dynamic system implied by the policy rules is stable. Mundell initiated a great deal of interesting research on the fiscal and monetary policy in an open economy. We shall refer to this research under the general heading of "fiscal-monetary policy models".

The balance of payments disequilibrium, if it is temporary and small in magnitude, can be financed by a change in the level of foreign exchanges; but if the duration of the disequilibrium is long enough, the government must adopt other adjustment policies to cure the deficit (or surplus). If we limit our analysis only to the current account of the balance of payments, we can broadly classify these policies into three categories: 1) domestic financial policies (fiscal and monetary policy), 2) exchange rate adjustments, and 3) trade and exchange controls. The first type of policy is aimed at reducing or increasing expenditures, while the impact effect of the other two policies is to switch expenditures away from foreign goods towards domestic goods. However, it must be noted that, on one hand, switching policies can have an increasing or decreasing effect on expenditures and vice-versa, and on the other hand, in order to maintain internal and external balance, in some situations policies aimed at changing the level of expenditures must be combined with switching

1) Robert A. Mundell : International Economics (London : MacMillan, 1968), in particular chapters 11, 16, 18.

policies (for example in Meadian conflictual situations, or in situations of full employment where an expenditure-switching policy must be used along with an expenditure-reducing policy).

When the capital account is included in the analysis, fiscal and monetary policy can be used as the only means of adjustment, under a regime of fixed or flexible exchange rates, provided that they have different relative impact on the balance of payments and on the domestic sector of the economy. However, as will be seen in the following section, where the fiscal-monetary policy models will be briefly analyzed, these models are not applicable for LDCs for several reasons. The first and most obvious reason is that in those countries it is frequent that no free capital movements are allowed. The second reason stems from the feasibility of interest rate policy and fiscal policy in LDCs and from the reliance by the governments of those countries on the expansion of domestic credit to finance their budget deficit.

Therefore the problem for LDCs is the choice of a combination of switching and expenditure-increasing or-decreasing policies and the choice between the different instruments of switching policies, namely between exchange rate adjustments and trade restrictions. It is evident that along with these policies, which exert their influence on the demand side of the economy, policies on the supply side are of equal importance : for example, diversification of exports, amelioration of the production of export crops, etc... Insofar as the deficit of the balance of payments of the LDCs may have monetary sources (excess domestic credit) or structural causes (a decrease in the foreign demand of their exports, for example), some combination of expenditure-reducing and expenditure-switching policies must be used. As for the choice between trade restrictions measures and exchange rate adjustments, the governments of these countries certainly take into account the necessity of growth and of the diversification of the exports, the optimum tariff argument, the state of organisation of the foreign exchange market, the terms-of-trade effect

of exchange rate variations, the implications of the possible instability of the export receipts for the domestic economy, international tariff negotiations, etc...

II.2. The Fiscal-Monetary Policy Models

II.2.1. General Features

This section will give a sketch of the main characteristics of the fiscal-monetary policy models and a summary of their conclusions on the use of fiscal and monetary policy for the double targets of domestic stabilization and balance of payments equilibrium.

Most of these models are cast in a comparative statics framework. Before describing the equations of a standard model, we first define the variables contained in the model :

Y = income ; E = private expenditures ; $\bar{G}$ = government expenditures ;
 T = balance of trade ; i = interest rate ; r = exchange rate ; L = demand for money ; M = supply of money ; R = stock of reserves ; $\bar{D}$ = domestic credit ; X = exports ; IM = imports ; B = balance of payments ;
 K = capital account of the balance of payments.

The two equilibrium relations in the goods and services market and in the money market are respectively :

$$Y = E(Y, i, r) + \bar{G} + T \quad (1)$$

where $T = X(r) - r \text{ Im}(r, Y)$, assuming that the price of domestic currency is unity and that r is the price of foreign in terms of domestic currency. Equation (1) states the equality between real national income and effective demand. Private expenditures are a function of income, interest rate and exchange rate.

$$L(Y, i) = M = R + \bar{D} \quad (2)$$

The demand for money is a function of income and the interest rate.

The third basic equation is the identity of the balance of payments with the change in foreign exchange reserves

$$dR/dt = B = T + K(i) \quad (3)$$

Using the usual assumptions about the partial derivations of the different functions, a comparative statics analysis, where the shift parameters are $\bar{G}$ or $\bar{D}$, leads to the following conclusions :

In a regime of flexible exchange rates, the more interest-elastic are international capital flows, the less effective is fiscal policy as a tool for domestic stabilization, compared with monetary policy. At the limit, when capital flows are perfectly elastic, fiscal policy has no effect on domestic income.

In a regime of fixed exchange rate, on the contrary, the increase in the mobility of capital strengthens the role of fiscal policy in domestic stabilization. Moreover, because of the monetary mechanism of international adjustment, monetary policy can only be used in the short run, at the cost of neutralizing its effects on the balance of payments (the short run effect of monetary policy on domestic income does not depend on the interest responsiveness of capital movements, but the rate of reserve change, which must be neutralized by an increase in domestic assets, does depend on capital mobility; at the limit, when capital is perfectly mobile, the domestic economy cannot have an interest rate different from the world interest rate, hence neutralization operations cannot be sustained any more, since the rate of reserve change will tend towards infinity). In the long run full equilibrium state of the economy, where the goods and services and the money markets, and also the

balance of payments are all in equilibrium, the fiscal policy has no effect on the domestic income, if capital is completely immobile, and monetary policy has no effect at all, whether capital is mobile or not.

In addition to these main conclusions¹⁾, some authors²⁾ have introduced the notion of income-elasticity of capital, along with its interest-elasticity, and have also worked out the accurate policy-mix to reach the two objectives of increasing the level of income and maintaining the equilibrium of the balance of payments in a regime of fixed exchange rate, or of increasing the level of income without altering the exchange rate in a regime of flexible exchange rates. Thus for example, in a regime of fixed exchange rate, if the interest elasticity of capital flows is sufficiently large, the rules for increasing income and keeping the balance of payments in equilibrium are an increase in government expenditures and a decrease in the money supply.

Another line of analysis is the assignment approach³⁾. Using the principle of effective market classification, one can arrive at the conclusion that in a regime of fixed exchange rate, monetary policy must be assigned to external balance and fiscal policy to internal balance.

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- 1) See for example : E. Sohmen : Flexible Exchange Rates, Chicago : University of Chicago Press, 2nd edition, 1969.
 - 2) H.G. Johnson : Further Essays in Monetary Economics (London : George Allen & Unwin, 1972), chapter 6 : "Some Aspects of the Theory of Economic Policy in a world of Capital Mobility" p. 151-166; R.W. Jones : "Monetary and Fiscal Policy for an Economy with Fixed Exchange Rates", Journal of Political Economy, Vol. 76, July/August 1968, p. 921-943.
 - 3) R.A.Mundell, op. cit. ; A.K. Swoboda : "On Limited Information and the Assignment Problem" in E.M. Claassen and P. Salin, ed. : Stabilization Policies in Interdependent Economics (Amsterdam : North-Holland Publishing Company, 1972), p. 101-115 .

II.2.2. Internal and external balance in LDCs

The above models rest upon the assumption that fiscal and monetary policies are independent instruments, which have different relative impact on the two targets of internal and external balance. In general, fiscal policy is defined as a change in government expenditures financed by public borrowing (the interest rate being constant), while monetary policy is defined either as a change in the domestic credit or a change in the interest rate (although in the case of perfect mobility of capital, the latter is precluded). The question is whether the distinction between fiscal and monetary policy is still valid for the LDCs, where the government budget deficit is generally financed by an increase in money supply and not by public borrowing. Another question arises with respect to the monetary policy : monetary policy in the above models operates through the change in the interest rate. In LDCs there is some doubt about the ability of the money supply to influence "the" interest rate, because of the imperfections of their capital markets. In fact, the consequence of the coexistence of an organized and an unorganized money markets is the dispersed nature of interest rates; monetary policy may have little influence (or at least it must take a long time to influence) interest rates in the unorganized sector, which generally heavily depend on monopoly profit considerations.

Moreover, exchange controls and controls on capital movements are frequent in LDCs. Thus the immobility of capital rules out the use of some combination of fiscal and monetary policies to achieve internal and external balance, because the practicability of such policy mix hinges on the responsiveness of capital movements to interest differentials.

Finally, the focus of the above models is rather on short run counter-cyclical policies, while the crucial problem of LDCs is the increase in their long run rate of growth. Hence, intuitively, we can infer that the LDCs must rely upon some other devices to equilibrate their balance of payments, given the necessity of growth and industrialization.

Since, as we have seen in the first chapter, disturbances in external payments are caused by excess domestic credit creation and/or by a structural change in foreign demand and supply of goods, it is more appropriate to think in terms of policies aimed at changing or switching expenditures. In this respect, it is particularly important to study the economic structure of the LDCs and their economic policies.

The method of analysis that we shall adopt in the following sections to analyze the problems of growth and of balance of payments in LDCs is unsatisfactory on several grounds. The least that we can say against it is that it looks like a "patchwork", insofar as a model (the neoclassical growth model) is used to analyze the situation of a closed economy, and then some additional comments on international trade and growth are presented to extend the analysis to the situation of an open economy. The most appropriate approach would be to develop a comprehensive neoclassical monetary growth model, in which the implications of trade and balance of payments problems for growth are taken into consideration. But such an approach involves a complexity of theoretical and technical difficulties, the handling of which is out of my reach.

II.3. Growth and the domestic economic policies

II.3.1. The neoclassical monetary growth model for a closed economy

In treating the problem of growth in LDCs, we shall not give any "strategy" or "model" of development. Our purpose is much less ambitious and consists in studying the effects of the two main economic policies, monetary and fiscal policy on the long run rate of growth. First, we shall briefly examine a standard neoclassical monetary growth model in the context of a closed economy and its implications for the economic policies of the LDCs. In their process of growth, LDCs will necessarily meet balance of payments problems and the policies which can help them

in coping with these problems will be discussed in the next section.

The following monetary growth model is borrowed from the excellent article of D. Levhari and D. Patinkin¹⁾, which inquires into the effects of monetary policy on the steady state growth path of an economy; Here we shall neglect the optimal properties of the model, i.e. the problems of Golden Rule and Full Liquidity Rule. Money is of the outside fiat variety, with no cost of production, and real money balances enter as an input into the production process of goods. The function of money as a producer's good is to free labor and capital for the production of more commodities, by simplifying the transactions between buyers and sellers.

The production function is thus of the form :

$$Y = G(K, L, M/P) \quad (1)$$

where Y = real output ; K = capital ; L = labor ; M = stock of money ; P = price level .

Real disposable income for households is defined as the sum of real output and the change in the stock of real balances :

$$Y_d = Y + d(M/P)/dt = Y + M/P(\mu - \pi) \quad (2)$$

where $\mu = (1/M).(dM/dt)$ and $\pi = (1/P).(dP/dt)$

The overall savings-income ratio can either be a constant or a function of some variables, such as the rate of return on physical capital , r ,

1) David Levhari and Don Patinkin : "The Role of Money in a Simple Growth Model", American Economic Review, Vol. 58, September 1968, p. 713-754.

the real rate of return on real money balances, $d-\pi^1)$, and a parameter β which represents the government fiscal policy :

$$s = s(r, d-\pi, \beta) \quad s < 1 \quad (3)$$

$$\partial s / \partial r > 0, \quad \partial s / \partial (d-\pi) > 0, \quad \partial s / \partial \beta > 0$$

where $r = \partial G / \partial K$ and d = nominal interest rate on money holdings.

The total amount of savings, S , is equal to : sY_d . But the change in the stock of real balances must be subtracted from that total to obtain the physical amount of savings, that is savings which accrue to investment in physical capital :

$$S_p = sY_d - d(M/P)/dt = sY - (1-s) M/P (\mu - \pi) \quad (4)$$

with $s < 1$ and $(\mu - \pi) > 0$ in a growing economy.

The demand for real balances is of the form :

$$M^d/P = \lambda \cdot Y \quad (5)$$

where $\lambda = \lambda(r, d - \pi)$ and $\partial \lambda / \partial r < 0$, $\partial \lambda / \partial (d - \pi) > 0$.

From equation (3) we can see that fiscal policy can increase the overall savings ratio s and hence the rate of growth in real output, since savings are held in the form of physical capital and real money balances, which both contribute to the production of commodities. But the

1) In the absence of any interest paid on money holdings, especially time and savings deposits, i.e. $d = 0$, the rate of return on real money balances is equal to $-\pi$. It is also assumed that the expected and actual rates of return are identical.

effect of monetary policy on the rate of growth is ambiguous. Let us take the case of inflation, for example. An increase in the nominal rate of growth of the money supply μ , and hence in the rate of inflation π , will decrease the demand for real balances, via equation (5), decrease the overall savings ratio, via equation (3); but the decrease in real money balances will increase the physical savings determined by equation (4). Thus the net effect on the production of real output is ambiguous.

However, McKinnon¹⁾ has objected to the substitution effect between physical capital and the holdings of real balances. His arguments rest on the importance of self-finance of investment in LDCs: in the absence of a perfectly homogenous capital market where any potential investor can have access to every source of finance, the increase in real balances held by the investor is necessary to initiate capital accumulation. Thus "over a certain range" of the real return on real balances, physical capital and real balances are complementary, but beyond a certain limit, they become substitutes. We can interpret this "complementarity proposition" in terms of equation (4): the effect of the real rate of return on the overall savings ratio outweighs its effect on the holdings of real balances, so that on the whole the physical savings, as determined by equation (4), increase with an increase in the real rate of return on real balances. Thus in the presence of complementarity between physical capital and real money balances, inflation, by decreasing the real rate of return on money holdings, will decrease the demand for real balances, the overall savings and the physical savings; the result is that an increase in the rate of inflation will decrease the production of real output.

Furthermore, if we add the government sector and its activities as a

1) Ronald I. McKinnon : Money and Capital in Economic Development (Washington D.C., The Brookings Institution, 1973) .

consumer and an investor, we can divide the newly issued money into three parts : 1) transfer payments to households (q_t) , 2) government consumption (q_c) , 3) government investment (q_i) , with $q_t + q_c + q_i = 1$. Thus the government can directly increase the capital stock by its investments, or it can decrease it by increasing the share of government consumption.

The above model is of great utility, for it provides a good framework to analyze the problem of the financing of growth at the least cost. In the first chapter, we have seen that inflationary finance of growth unavoidably entails costs for the economy as a whole and on balance is not advisable. Now, using the production function as defines by equation (1), let us do a small exercise. The differentiation of the production function with respect to time will give us the rate of growth of real output :

$$\dot{Y} = \frac{\partial G}{\partial K} \dot{K} + \frac{\partial G}{\partial L} \dot{L} + \frac{\partial G}{\partial (M/P)} (\dot{M/P}) \quad (6)$$

From this relationship we infer that, contrary to some earlier views which gave to the accumulation of physical capital an exclusive role in the growth process, the increase in the capital stock plays a role, but not the crucial one, in the process of increasing the income level. As important for growth as capital accumulation are such factors as the increase in the productivity of capital, of labor and of real balances, the increase in the stock of real balances and the labor force. As we have mentioned earlier in the first chapter, the improvement in productivity requires a profound reorganisation of the entire economic system (and of the social system ?). The increase in the stocks of capital and of real money balances can be, to some extent, influenced by the monetary and fiscal policy of the government, as it follows from the neo-classical monetary growth model.

In the first instance, the propensity to save of the economy as a whole, as stated by equation (3) , increases with a rise in the real rate of

interest (which is the marginal product of capital), a rise in the real return on real balances and a rise in taxes. The real return on real balances can be raised in two ways : by increasing the nominal rate of interest paid to the holders of real balances and by decreasing the rate of inflation. It can be further added that the decrease in the inflation rate may be able to increase the real rate of interest, insofar as the elimination of uncertainty attached to an inflationary environment improves the quality of the capital stock. In other words, a fall in the inflation rate will create a shift from investments with low marginal efficiency of capital to investments with high marginal efficiency of capital, including the investments in the research for new and better production processes; the result is that the marginal product of capital is increased. Finally there is a feedback effect of growth on savings : many empirical studies¹⁾ have proved that the savings-income ratio is highly correlated with the rate of increase of the income level. Thus, for any given income level, the savings function can be described by equation (3), but over time, growth ($\dot{Y}$) has also a role to play in the savings function.

The stock of real balances is also positively related to the real rate of return on real balances, and if physical capital and real balances are complementary or if the effect of the real rate of return on real

1) S. Kuznets : "Quantitative Aspects of the Economic Growth of Nations; V. Capital Formation Proportions : International Comparisons for Recent Years", Economic Development and Cultural Change, Vol. 8, 1960, No. 4, Part II; H.S. Houthakker : "On Some Determinants of Saving in Developed and Under-developed Countries", in E.A.G. Robinson, ed. : Problems in Economic Development, London, McMillan & Co. Ltd, p. 212-227, 1965 (International Economic Association Conferences No. 18) .

balances on the overall savings ratio outweighs its effect on the holdings of real balances, the stock of physical capital can also be increased with a rise in the real rate of return on real balances.

II.3.2. Economic Structure and Economic Policies in LDCs

The above analysis leads us to the proposition that appropriate fiscal and monetary policy can foster growth. In fact, if the government raises the real rate of return on real balances by increasing the nominal rate of interest paid to holders of time and savings deposits and/or by (gradually) reducing the rate of inflation, real output can be increased.

In reality, LDCs, by their economic structure, are bound to certain limits. On the fiscal side, fiscal receipts cannot be expected to rapidly and substantially increase. Although the fiscal system may differ from country to country, there are, however, some general features common to most of LDCs¹⁾. Because of the low level of income in these countries, of the weakness of their administrative apparatus, direct taxation cannot be an important source of government revenue. The efficiency of income taxation requires for example that a large share of total income consists of wages and salaries, that personal income is actually recorded; but these conditions are badly fulfilled in LDCs, where agricultural producers, small retailers and shopkeepers constitute the largest income group. Nevertheless, there is scope for an

1) For a brief survey of fiscal system and fiscal policy in LDCs, see : J.H. Adler : "Fiscal Policy in a Developing Country", in K. Berriell, ed. : Economic Development with Special Reference to East Asia, London, McMillan & Co. Ltd, 1964. (International Economic Association Conferences No. 14)p. 287-315.

increase in direct taxation of the highest income groups : income taxes and taxes on land and real property for this category of population can be more efficiently levied, without fear of inequity or of saving disincentive. In this respect, the fiscal (and government) administration must be improved to cope with such problems (not necessarily unsurmountable) as fiscal frauds, the political influence of high income groups who are at the same time landowners and owners of urban property, the proper assessments of real property, the correction of tax rates in accordance with the rate of inflation, etc.

The minimum conditions for a greater role of direct taxation in the fiscal system are an increase in income levels, an amelioration of the fiscal and government administration, but one can be reasonably certain that they cannot be satisfied in a fortnight. In the near future, therefore, consumption taxes and taxes on foreign trade will continue to hold the lion's share in government revenue of most of the LDCs. The following table will convince us of this fact :

TABLE 1 : Share of indirect taxes and customs duties in developed and less developed countries, 1968

Per capita GNP class (in US dollars)	Number of countries	Indirect taxes as percentage of total tax revenue	Customs duties as percentage of total tax revenue
Developing countries			
100 or less	20	68	35
101 - 200	11	64	32
201 - 500	19	64	33
501 - 850	9	50	18
Developed countries			
over 850	15	32	4

Source : John F. Due : Indirect Taxation in Developing Economies : The Role and Structure of Customs Duties, Excises, and Sales Taxes (Johns Hopkins Press, 1970) .

From the revenue point of view, consumption taxes on domestic products and on imports can bring the highest yield if the taxed commodities have a high income elasticity and a low price elasticity of demand. Thus progressive rates can be applied to different categories of commodities, running from staple goods to "luxuries" or "non-essential" goods. However, the low level of income imposes a limit to the increase in consumption taxes; in addition, the base of the import duties can be shrunk by the policy of import substitution and of prohibitive tariffs. The other form of taxation of foreign trade is export taxes, which are often adopted because they are easy to collect and they constitute a substantial source of tax revenue in export-oriented economies. However, the revenues from export taxes are unstable, because of the fluctuations of export receipts (the same fluctuations may be encountered in the case of import duties, insofar as import expenditures are tied to export earnings). Another disadvantage of export taxes is that they can create a disincentive effect on export production and a resulting shift of production away from export markets to home markets.

Another noninflationary means of financing government expenditures is to capture private savings through the sale of government bonds. But the prospect for an increase in long-term public debt is also poor, because of the weakness and even the absence of capital markets, although in some LDCs there is a "captive market" for government bonds. Besides the problem of the small amount of savings that could be mobilized, in a world overridden by uncertainty, the risk aversion and the liquidity preference of savers make that borrowing has limited time and quantity dimension, that is the amount of lending is small and the debt maturity is short. Frequently, instead of investing in long term securities, the potential borrowers prefer direct investments, either by themselves or by relatives and friends.

In a growing economy, government expenditures are bound to expand and in the face of the fiscal constraint described above the government

inevitably appeals to the Central Bank to finance its budget deficit; inflation will be the direct consequence of this policy. In some cases, inflation tends to be of a self-generating nature, because the government budget deficit itself is a function of the rate of inflation¹⁾. The process is simple : the monetary base increases as the government budget deficit increases. The government budget deficit is the difference between government expenditures and government revenue, which mainly consists of tax receipts. At the beginning of any fiscal period, real amounts of expenditures and revenue are fixed, but as the price level rises because of inflation, the nominal value of expenditures and revenue also rises, and the actual nominal values during or at the end of the fiscal period exceed the planned nominal values. But if nominal value of expenditures is easily adjusted, the adjustment of nominal tax receipts is sluggish and tends to lag behind the adjustment of nominal expenditures, making the nominal deficit still larger. There are several reasons for the sluggishness of the government revenue : the authorities have assessed a fixed nominal value of tax receipts sometime in the past and do not allow for inflation in setting tax liabilities; moreover the payment of these taxes is sometimes deferred and when it occurs, the real value of the fiscal receipts has depreciated. Therefore at the end of the fiscal period, the actual nominal government budget deficit, as a result of inflation, is still larger and, consequently, the monetary base increases further.

1) Two empirical studies have shown the self-perpetuating character of inflation in two LDCs : Dean S. Dutton : "A Model of Self-Generating Inflation", The Argentine Case", Journal of Money, Credit and Banking", Vol.3, May 1971, p. 245-262; Bijan B. Aghevli and Moshin S. Khan : "Inflationary Finance, Welfare Cost and the Dynamics of Inflation : The Indonesian Case", unpublished.

There is thus a direct relationship between inflation and the government budget deficit. The rate of inflation can be lowered, if the government decreases its budget deficit and, consequently, the rate of growth of the money supply. But even if the government succeeds in eliminating its deficit (the problem is not an easy one, given the fiscal constraint), the reduction in the inflation rate will occur with a time lag. Nevertheless the reduction of inflation can have a positive effect on overall savings, as is implied by the above neoclassical growth model. The other policy to increase savings is to raise the nominal interest rate paid on money holdings and this policy can also be used as anti-inflationary device. At least two authors¹⁾, A.G. Chandavarkar and R.I.

Mc Kinnon, have demonstrated the importance of interest rate policy for the mobilization of savings and also for the optimum allocation of savings in LDCs. The problem at issue is whether interest rates can influence savings, financial savings and overall savings as well. The interest rates in question are real interest rates, that is nominal interest rates minus the expected rate of inflation, and, then, interest rate policy cannot be independent from the inflation problem, for what is important is to ensure positive real rates of interest to attract savings. Two questions arise. First, is there a rationale for a policy of higher interest rates in LDCs ? Second, can interest rates influence savings ?

The rationale for high interest policy is to be found in the dispersed nature of capital markets in LDCs, The two famous articles of

1) Anand G. Chandavarkar : "Some Aspects of Interest Rate Policies in less Developed Economies, The experiences of Selected Asian Countries", International Monetary Fund, Staff Papers, Vol. 18, March 1971, p. 48-112; Ronald I. McKinnon, op. cit.

U Tun Wai¹⁾ have demonstrated the existence of two capital markets in LDCs, the organized and the unorganized markets, which broadly correspond to the dichotomy between the urban industrial sector and the agricultural sector. The "organized" money market comprises all the banking and financial institutions, whether governmental or private, which generally make loans and advances to the government, (urban) traders and manufacturers. The lenders in the "unorganized" sector are, for the most part, professional moneylenders, landlords, while the borrowers are exclusively small agriculturalists, cottage industrial workers and some retail shopkeepers. Given the importance of agriculture in the LDCs, it is not surprising that the size of the unorganized market is much more important than the size of the organized market; Chandavarkar²⁾ has superficially estimated that only one fourth-of total credit is financed by the organized sector. The link between the organized and the unorganized markets in the same country is often very poor, as is already pointed out by U Tun Wai, and as is reflected by the large difference in the levels of interest rates in the two markets : interest rates in the unorganized sector are in the range of 24 - 50% , while they are in the range of 10 - 12% in the organized sector³⁾. On the other hand, there is a close parallelism between the interest rates in the organized market of LDCs and those in the developed countries : for instance, the interest rate charged on commercial bank advances for

1) U Tun Wai : "Interest Rates in the Organized Money Markets of Underdeveloped Countries", International Monetary Fund, Staff Papers, Vol. 5, August 1956, p. 249-278, and : "Interest Rates outside the Organized Money Markets of Underdeveloped Countries", International Monetary Fund, Staff Papers, Vol.6, November 1957, p. 80-142.

2) Chandavarkar, op. cit.

3) Chandavarkar, op. cit.

the period 1958-69 is at the same approximate level of 8% (except for those of LDCs, like Taiwan, Korea and Indonesia, which have experienced high interest policy). This similitude leads to the conclusion, often claimed, that the level of interest rates in the organized sector of LDCs is low and inadequate and does not truly reflect the scarcity of capital in those countries.

The low level of interest rates in the organized sector is the result of the imperfections of the capital market. The government imposes ceilings on interest rates, mainly for two purposes : to permit government borrowing at low cost and to encourage investments for development. In some LDCs, there is a captive market for government securities, i.e. there are statutory requirements for minimum ratios of investment by financial institutions and social security funds in government securities; moreover the attractiveness of government securities is strengthened by the lack of alternative investments in equally safe assets. Cheap bank credit, with "preferential" rates, is also provided to a small group of "essential" industries, along with other privileges, as tax concessions, privileged access to raw materials. This cheap credit policy necessarily involves economic distortions and does not implement an optimum allocation of the scarce resource, which is capital. In addition, interest rates paid to depositors are concomittantly low and do not attract savings into the organized sector, especially when the real return on holdings of money balances becomes negative in inflationary periods. The third and less important factor which contributes to the low level of interest rates in the organized sector is the link between the organized money market of LDCs and the money market of developed countries, since branches of foreign banks sometimes represent a large part of financial institutions of the LDCs.

In contrast, interest rates in the unorganized sector are excessively high and result mainly from the semi-monopolistic position of the money-lenders and the risk represented by the lack of guarantee offered by borrowers. In fact, the low level of income of the peasants and cultivators does not permit an increase in their savings and, a fortiori, does not

not release sufficient funds to finance their investments and sometimes their everyday expenditures. The paucity of institutional credit in rural areas contribute to the lack of competitive sources of credit.

Thus, a policy of higher interest rates in the organized sector can be rationalized on the ground that higher interest rates will allocate savings more efficiently between different investments and will attract savings into the organized sector, permitting thus an extension of institutional credit in the unorganized sector and, consequently, a greater integration of the capital market. The objective is also to lower the excessive cost of credit in the unorganized sector, and the best policy in this purpose is to offer more competitive credit sources to the cultivators. However, the multiplication of financial institutions in the rural areas is inseparable from a vast program of agricultural development, which will increase the cultivators' income and savings.

The policy of high interest rates is also a useful device to combat inflation and its efficiency in this respect depends on its ability to increase the holdings of real balances. It was also argued in the theoretical analysis that the rise in the real rate of return, in expected real rate of return, can increase overall savings and physical savings and, consequently, the rate of growth of real output. The problem which arises is, then, the relation between personal savings and the expected real rate of return on money holdings and on overall savings and can be tackled by the examination of some instructive experiences.

The two most conclusive experiences of high interest rate policies are the cases of Taiwan and Korea, which are extensively studied by Chandavarkar and McKinnon¹⁾. Our task here is to give a brief summary of

1) Chandavarkar, op. cit. ; McKinnon, op. cit.

these experiences and to draw some additional comments on their results. Taiwan and Korea have used the high interest policy, first as an anti-inflationary measure, and also as an attempt to render the capital market more homogeneous. At some time in their economic history, they have raised the deposit rates and, parallelly, the lending rates of the commercial banks. Tables 2 and 3 summarize the history of these experiences.

In 1950, to curb hyperinflation, the Taiwanese authorities introduced a system of preferential deposits of very short maturities (one-month, two-month and three-month), with very high interest rates. They, then, introduced longer-term deposits, six-month and one year, in 1953 and two-year in 1956, which also bore high interest, while gradually lowering the interest rate on short-term deposits. In 1959, interest rates charged on government borrowing also increased and government bonds with maturities of 12 and 30 months and nominal interest rates varying from 9% to 18% were issued. If in the 1950s nominal interest rates were increased, they were gradually lowered subsequently, when the price level was more or less stabilized in the 1960s. Concurrently with the high interest rate strategy, the government adopted a balanced budget policy in his stabilization program, and, in this respect, had benefited from a massive US aid.

Holdings of real balances steadily increased and made a substantial upward jump in 1958. The inflation rate was considerably reduced, from the year 1953 and later on. Savings as a percentage of Gross National Product began to increase markedly only from 1960-61. But the most successful result was probably the considerable lowering of interest rates in the unorganized capital market. By the years 1958-59, the interest rates charged by private moneylenders varied from 36% to 40%, while the average free market rate for unsecured loans in the past had attained extremely high levels : 208% in 1949, 144% in 1950, 126% in 1951. For comparison, by the years 1958-59, the interest rates charged on secured and unsecured bank loans were in the range of 19.8% - 22.3%. Thus a certain homogenisation of the money market was reached.

TABLE 2. The Financial Structure of Taiwan, 1950 - 1970
(Rates in percent per annum, amounts in billions of new Taiwan dollars)

Year	Money Supply		Total (M ₂)	Nominal Interest Rate on one-year deposits	Nominal Interest Rate on 3-month deposits	Whole sale Pri- ce Index (WPI) 1963=100	Percen- tage chan- ge in WPI	Ratio of M ₂ to WPI	Savings as % of GNP at current prices	Government Sector	
	Demand de- posits plus currency (M ₁)	Time and savings deposits								Expendi- tures	Revenue
1950	0.58	...	0.58	...	39.60	22.4		0.026	...	...	...
51	0.94	...	0.94	...	54.00	36.4	+62.50	0.026	...	...	...
52	1.29	0.52	1.81	...	25.80	44.8	+23.08	0.040	...	9.505	9.326
53	1.68	0.69	2.37	24.80	15.60	49.0	+ 9.38	0.048	3.9	9.587	10.134
54	2.13	0.88	3.01	19.20	13.20	50.3	+ 2.65	0.060	3.5	11.724	12.493
55	2.56	1.03	3.59	19.20	13.20	57.3	+13.92	0.063	3.5	11.724	13.400
56	3.23	1.07	4.30	21.60	12.00	64.3	+12.22	0.067	4.0	13.520	13.238
57	3.80	2.18	5.98	19.80	10.20	69.2	+ 7.62	0.086	3.7	14.649	14.055
58	5.13	3.82	8.95	19.80	10.20	69.9	+ 1.01	0.128	4.3	15.016	16.966
59	5.57	4.99	10.56	17.04	9.00	77.6	+11.02	0.136	3.8	15.916	17.243
60	6.11	6.25	12.36	17.04	9.00	88.1	+13.53	0.140	5.0	15.993	17.329
61	7.34	10.24	17.58	14.40	7.20	91.6	+ 3.93	0.192	7.2	16.460	18.104
62	7.92	13.01	20.93	13.32	6.48	94.4	+ 3.06	0.222	7.4	17.861	18.577
63	10.20	17.18	27.38	12.00	6.00	100.0	+ 5.93	0.274	9.5	18.190	18.325
64	13.43	21.73	35.16	10.80	6.00	102.5	+ 2.50	0.343	10.5	18.313	19.238
65	14.84	25.50	40.34	10.80	6.00	97.7	- 4.68	0.413	10.3	20.302	24.089
66	17.39	32.32	49.71	10.08	6.00	99.2	+ 1.54	0.501	12.7	20.748	25.902
67	22.10	38.92	61.02	9.72	5.40	101.6	+ 2.47	0.601	13.2	22.939	29.278
68	24.89	43.54	68.43	9.72	6.48	103.8	+ 1.97	0.661	11.5	25.471	37.426
69	28.92	53.07	81.99	9.72	6.48	103.3	- 0.29	0.794	...	...	...
70	35.09	66.50	101.59	9.72	...	106.2	+ 2.81	0.957	...	...	...

Sources : A.G. Chanvarkar, op. cit. and R.I. McKinnon, op. cit.

and : International Financial Statistics (International Monetary Fund)
Taiwan Financial Statistics (Central Bank of China)
National Income of the Republic of China (Directorate-General of Budgets, Accounts and Statistics)

TABLE 3. The Financial Structure of Korea, 1960-70
(Rates in percent per annum, amounts in billions of Won)

Year	Money Supply		Nominal Interest Rate on one-year time deposits	Nominal Interest Rate on 3-month time deposits	Nominal Interest Rate on Savings deposits	Whole Price Index (WPI) 1963=100	Percentage change in WPI	Ratio of M_2 to WPI	Savings as % of GNP at current prices
	Demand deposits plus currency (M_1)	Time and savings deposits (M_2)							
1960	22.1	5.9	10.0	9.0	16.8	67	...	0.4179	...
61	32.5	8.9	12.1	9.0	16.8	76	13.4	0.5447	...
62	35.1	16.6	15.0	9.0	16.8	83	9.2	0.6229	2.85
63	37.6	17.5	15.0	9.0	16.8	100	20.5	0.5510	7.17
64	48.9	14.7	15.0	9.0	16.8	135	34.6	0.4725	6.51
65	65.6	31.5	18.8	18.0	30.0	148	9.9	0.6565	5.80
66	85.2	70.2	30.0	18.0	30.0	161	8.9	0.9646	8.94
67	122.0	130.8	30.0	18.0	28.0	172	6.5	1.4741	7.03
68	153.6	255.5	27.6	...	25.2	185	8.0	2.2078	...
69	218.2	452.5	24.0	14.4	22.8	198	6.7	3.3908	6.85
70	305.6	585.2	24.8	...	...	216	9.1	4.1279	...

Sources : A.G. Chandavarkar, op.cit. and R.I. McKinnon, op.cit.
and : International Financial Statistics (International Monetary Fund)
Monthly Statistics Review (Bank of Korea)

In the same vein, Korea has adopted a high interest policy, along with a balanced budget policy to stabilize its price level. In 1965, the official ceilings on nominal interest rates on time and savings deposits raised from 15% to 30%. Interest rates remained high in the following years, but gradually decreased from 1968-69 and later on, as inflation lessened. During the period 1964-66, the Korean government was successful in increasing tax revenues relative to expenditures.

As a result of the stabilization policies, the inflation rate was considerably reduced right from 1965. Monetary savings substantially increased : + 123% in 1966, + 84% in 1967, and even after the lowering of interest rates on deposits in 1968, they continued to rise : + 94% in 1968. No clear-cut conclusion can be drawn on the behavior of savings as a percentage of GNP at current prices, except that they made a marked upward jump in 1966, but decreased later on. Unfortunately, no data on the unorganized sector are available.

From these two experiences, what can we say about the effects of the high interest policy on the mobilizations of savings and on the price stabilization ? We first notice that this policy is only transitional in both cases, for interest rates were lowered as inflation became milder. In the Korean case, the influence of interest rates on monetary savings and, consequently, on the inflation rate are undoubtedly important, for already in 1965 where the high interest strategy was introduced, the inflation rate was considerably reduced and monetary savings were subject to a large increase. In the case of Taiwan, however, the least that we can say is that the effects of interest rate policy on the holdings of real balances and on the price level operate with a lag. Overall savings, as percentage of GNP at current prices, also increased in both cases, but with a time lag. Nevertheless, in the subsequent period where nominal interest rates were reduced, we can reasonably assert that the balanced budget policy and the expectations effect have some role to play in the reduction of the inflation rate.

The determinant factor for savings is probably the expected real rate of return on money holding. Therefore, along with the nominal interest rate paid on deposits, the expected rate of inflation must also be taken into consideration; a stable economic environment is always favourable for savings and investments. As expectations are generally formed from past experiences of inflation and as there is an undeniable correlation between the nominal money supply and inflation, the government budget, as a potential generator of an increase in the nominal money supply, must be carefully balanced to stabilize the price level. In conclusion, then, I would argue that control over the money supply is the most important and successful stabilization device, and high interest policy can be used, concomittantly, but as a short-run and transitional measure. However, in the context of LDCs, the interest rate policy is necessary for the integration of the capital markets through the extension of the organized sector and for a more efficient allocation of savings between investments.

II.4. Growth and the balance of payments

II.4.1. Trade and development

The relation between trade and development can be viewed in two (reciprocal) ways : the influence of the growth in income on the balance of payments and the consequence of international trade, i.e. of the opening of the economy to the rest of the world, on the domestic rate of growth.

The first point can be illustrated by a very simple version of the monetary approach to the balance of payments; the present version is adapted from the monetary model of the first chapter and also takes into account domestic economic growth. Let us recall that the principal message of the monetary approach to balance of payments theory is that the balance of payments results from the adjustment by the public to a

discrepancy between its desired demand for money and the stock of money supplied (for the sake of simplicity, the bonds market and the capital account of the balance of payments are ignored). The conclusions which will follow are a restatement of earlier analyses¹⁾ : growth in itself is not necessarily accompanied by a balance of payments deficit, unless the domestic rate of monetary expansion increases; on the contrary, an exogenous increase in real income will create a balance of payments surplus.

The first equation of the model defines the real demand for money as a function of real output y and the expected rate of inflation π^e . Let P be the price level and note that $y = Y/P$:

$$M^d = P \cdot f(y, \pi^e) \quad (1)$$

$$\partial f / \partial y > 0 \quad , \quad \partial f / \partial \pi^e < 0$$

The second equation sets up a function for the expected rate of inflation, π^e which depends on the rate of inflation in the rest of the world $\bar{\pi}^f$ and on the rate of monetary expansion μ . When the system is in equilibrium, the domestic expected rate of inflation is equal to the domestic actual rate of inflation, which is identical with the rate of inflation in the rest of the world :

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- 1) R. Mundell : "Growth and the Balance of Payments", chapter 9 of : International Economics (London : MacMillan, 1968), p. 134-139;
H.G. Johnson : "The Monetary Approach to Balance of Payments Theory", in M.B. Connolly and A.K. Swoboda , ed. : International Trade and Money, (London, Allen & Unwin Ltd, 1973) p. 206-224; Ryutaro Komiya : "Economic Growth and the Balance of Payments : A Monetary Approach", Journal of Political Economy, Vol. 77, January/February 1969, p. 35-48.

$$\begin{aligned}\pi^e &= g(\bar{\pi}^f, \mu) \\ \partial g / \partial \bar{\pi}^f &> 0, \quad \partial g / \partial \mu > 0\end{aligned}\quad (2)$$

The third equation states that real output is a function of exogenous factors α , such as an increase in productivity, and of the rate of monetary expansion μ . Although there is a strong and legitimate doubt about the effectiveness of inflationary finance, nevertheless we do not rule out the possibility of a positive effect of monetary expansion on real output (but we expect this effect to be small) :

$$\begin{aligned}y &= h(\alpha, \mu) \\ \partial h / \partial \alpha &> 0, \quad \partial h / \partial \mu > 0\end{aligned}\quad (3)$$

The fourth equation is the identity of the stock of money with the sum of the stock of foreign exchange reserves, R , and the outstanding domestic credit, C :

$$M = R + C \quad (4)$$

The fifth and last equation states that hoarding is a partial adjustment to a discrepancy between the demand for and the supply of money :

$$dM/dt = \alpha(M^d - M) \quad (5)$$

The balance of payments is the change in the stock of reserves and, from equation (5), is equal to the difference between hoarding and the rate of change in domestic credit : $dR/dt = dM/dt - dC/dt$.

Real output can be increased by an exogenous factor α such as an increase in productivity, or by an increase in the rate of monetary expansion. An exogenous increase in real output will increase the demand for money, by equation (1), which will increase hoarding, by equation (5).

If domestic credit remains unchanged, the effect of this exogenous growth of real output is a balance of payments surplus. An increase in the rate of monetary expansion can increase real output, but at the same time it increases the expected rate of inflation; the final effect on the demand for money is uncertain. However, as we have noted earlier, the increase in real output is expected to be very small, hence the most probable outcome is a decline in the demand for real money balances (M^d/P). Nominal demand for money M^d can either decrease, or be constant, or increase slightly but certainly less than the nominal supply of money. The consequence is that, from equation (5), hoarding will decrease and the process will wind up with a balance of payments deficit.

It must be emphasized that the above analysis bears on the "impact effect" of economic growth on the balance of payments position, for balance of payments surplus or deficit is only a short phenomenon and in the long run steady state the balance of payments must be in equilibrium.

Turning, now, to the other aspect of the problem of trade and development, i.e. the contribution of international trade on economic growth, we shall pay a special consideration for the situation of LDCs in the modern world. Trade, certainly, is beneficial for a small country, which can in no way live in autarchy, for it is only through international trade that it can buy goods that are essential for industrial development and are not domestically produced, and it is also through international trade that it can increase income by selling goods to the rest of the world. However, there is more and more consensus on the necessity of a modification of the classical comparative advantage argument to adapt to the present context of LDCs, for which completely free trade based on comparative cost criterion can be detrimental.

It is clear that a small country with its limited factors endowment can increase its income by participating in international trade, which will provide it the benefits of an efficient international specialization. Thus the static Heckscher-Ohlin version of the comparative advantage theory states that a country will benefit from trade by producing commodities that use more of its relative abundant factors of production. A crude application of this principle will lead LDCs to produce and export primary commodities and import capital-intensive industrial goods.

The criticisms which were raised against this view do not justify a complete rejection of the theory, but bring to light the necessity of introducing dynamic considerations. The first modification to be brought about is in the concept of opportunity cost : because of existing market imperfections in LDCs, the market prices of factors and commodities do not reflect their true opportunity cost; moreover, economic development itself will change the pattern of factors costs. Hence some "dynamical shadow prices" must be used to evaluate the programs of production, based on comparative advantage analysis. Secondly, the nature of the world demand for primary products itself is a strong argument against a heavy specialization in this category of commodities. The demand for primary products, especially for agricultural products, is subject to low income and price elasticities and also to cyclical fluctuations; the development of synthetic substitutes and of agricultural protection in richer countries contribute further to the decline in world demand. One cannot conclude, however, that there is an adverse trend in the terms of trade in LDCs, since, until now, this fact cannot be firmly established; this is not to say, either, that continued specialization in primary exports must be abandoned as a short run policy. Rather, in view of the not much bright prospects for exports of primary products, the LDCs must include in their long run development strategy a diversification of their exports and an intensified industrialization. Thirdly, dynamic external economies are expected to be important in LDCs and cannot,

thus, be neglected. By dynamical external economies are meant the increase in demand and the reduction of costs, resulting from a simultaneous expansion of a number of sectors of production. It is argued that external economies are more important in the industrial sectors than in the agricultural sectors because of the gains from economies of scale, training effects and high demand elasticities, and that those external economies can be increased further if a "balanced growth" strategy is adopted, i.e. if several industrial sectors are expanded at the same time, because of the horizontal and vertical interdependence of sectors of production. The infant industry argument holds a similar line of reasoning, by appealing to the possible increase in productivity from the process of "learning by doing". It is undeniable that the increase in productivity and in external economies over time play a great role in the national economic development. However, it is not certain that the improvement in productivity and technology is more important in the industrial sector than in the agricultural sector; as LDCs have an evident "advantage" in primary products ("advantage" is not perhaps the proper word, but it is used to reflect the specialization resulting from the fact that a great percentage, nearly 80% , of the population live in the agricultural sector), and given the limited resources in capital and labor, a rational industrialization program, from my personal point of view, would be to develop first industries more or less related to agricultural activity. This policy has the advantage of improving efficiency in the major activity of the national economy and of avoiding a too serious dichotomy between urban and rural sectors. Of course, this kind of policy does not exclude the development of other industries, which are not linked to agricultural activity, on a "balanced growth" basis.

Those are some of the dynamical factors which alter the classical comparative advantage argument. However, it must be pointed out, once again, that the critics against a static concept of comparative advantage do not imply a complete refutation of the argument. On the contrary, if the actual specialization of LDCs in primary exports cannot persist in

the future, the increasing shortage of foreign exchanges, resulting from a decline in exports, justifies the use of comparative costs criterion in a cost-benefit analysis to evaluate the programs of import substitution and of implementation of new industries : the comparison of domestic with foreign sources of supply that is suggested by the comparative advantage analysis will help to reallocate efficiently foreign exchange receipts between the different investment projects, since industrialization will involve imports of capital and industrial input goods.

At the same time, as an integral part of a development program, economic policies aiming at achieving balance of payments equilibrium or at least at improving the payments position must be implemented; for, beyond the question of increasing the foreign exchange receipts, the fulfilment of external balance would avoid the adoption of domestic economic policies under the pressure of bad external positions. Thus policymakers would not take irrational and shortsighted measures, which would be dictated by a serious balance of payments deficit and which could have detrimental effects on domestic economic growth. In this circumstance, domestic economic policies would be the most efficiently conceived to foster growth.

II.4.2. Balance of payments policies

Some preliminary words must be said about the economy of LDCs. The starting point of discussion is the identity of balance of payments in terms of national account :

$$C + S + T = C + I + G + (X - IM)$$

or

$$X - IM = (S - I) + (T - G)$$

In this way, the economy of LDCs can be easily described in terms of three major constraints : the foreign exchange constraint, which derives from the slow growth of export receipts, the savings constraint, which comes from the incapability of savings to increase rapidly and substantially in the short run, and the fiscal constraint, which results from the poor prospect for tax receipts, as a form of forced savings, to rise.

In short, these constraints imply a tendency for expenditures to exceed income : the needs of industrialization require an increasing volume of imports, while , as we have seen in the preceding section, the present primary exports cannot be expected to expand; the needs of development are translated into increasing investment and government expenditures. The pressure of expenditures over income induces inflation and balance of payments deficit. At first sight, therefore, one should "prescribe" an adjustment of exchange rate, to reflect the true value of domestic currency, along with trade restrictions, particularly in the form of complete prohibitions of certain imports, giving priority to imports necessary to development, to match import requirements with export receipts. In the following sections, the different aspects of exchange rate policies and commercial policies will be discussed and we shall attempt to draw some practical conclusions for LDCs.

a) Exchange rate policies

Countries are often confronted with the choice of an exchange rate policy, or, more specifically, with the choice of the appropriate relationship between the domestic currency and some international monetary standard. The arguments underlying the choice, especially for LDCs, will be examined under two general headings. In the first step, we shall discuss the arguments pertaining to the systems of fixed exchange rate, flexible exchange rates, or adjustable peg, assuming that the world consists of one small LDC and a homogenous bloc of

countries, the "rest of the world". But after the international monetary disturbances of 1971, most of the key currencies float in terms of each other, adding other difficulties for LDCs in the management of their exchange rates and of their reserve portfolio. Therefore, some aspects of these new difficulties, in a world of floating rates, will be analyzed.

The general theoretical discussion about the appropriateness of fixed or flexible exchange rates turns around the question of the independence of domestic monetary policy and the question of the insulation of the domestic economy from external shocks in the rest of the world. The pros and cons of fixed and flexible exchange rates systems has been debated by many economists, and in what follows the main lines of reasoning of both side will be set down again, in the purpose of searching for an appropriate exchange policy for LDCs.

Under a regime of fixed exchange rates, fluctuations in output and inflation rates are spread over all the world. As we have seen in the first chapter, in an open economy, inflation is imported via the balance of payments surplus and the induced increase in the prices of traded and non-traded goods. As for the foreign fluctuations in output, they will be transmitted to the domestic economy via the foreign trade multiplier. Moreover, a small country is bound to abandon the independence of its domestic economic policies, for monetary and fiscal policies do not have any long run effect on the domestic economy. Expansionary policies will worsen the balance of payments and the authorities must correct the external deficit by using one of the four measures : 1) changing the domestic economic policies, 2) imposing direct controls on foreign trade, 3) adjusting the exchange rate, 4) depleting the stock of international reserves. Thus the world under the system of fixed exchange rate is viewed as being a big country with one single currency; harmonization of national economic policies and international control of the growth of international liquidity are necessary for a smooth working of the system. On the other

hand, countries willing to conduct an independent domestic economic policy must eventually hold a large stock of reserves to regulate the resulting disturbances in its foreign position. In this respect, there may be some welfare costs resulting from the holdings of international reserves, which bear a low rate of return, relatively to real goods, either investment or consumption goods. Therefore, if we consider the use of direct controls to correct a balance of payments deficit as an ill-advised measure, which brings distortions to the allocation of resources, and if we also rule out the possibility of changing domestic economic policies according to the external position of the country, we are then left with some trade-off between the holdings of large reserves and the adjustments of the exchange rate¹⁾.

Turning now to the case of flexible exchange rates, its advocates also appeal to the arguments of insulation of the domestic economy from external shocks and independence of domestic economic policies. If in the case of fixed exchange rate the economic policies of different countries in the world are linked together by the foreign component of their monetary base, in the case of flexible exchange rates the stock of foreign exchanges of each country remains fixed, because the exchange rate adjusts to maintain the balance of payments in equilibrium. Hence domestic income is determined by domestic expenditures and the flexible

1) However, it must be reemphasized that to achieve long run internal and external equilibrium, LDCs must rely simultaneously on domestic income and price policies, on direct controls, and on exchange rate adjustments, as we have pointed out in the preliminary notes at the beginning of this section. The high short run costs of direct controls and changes in domestic economic policies are referred to deviations from the chosen equilibrium path.

exchange rates will allow, in the long run, inflation rates to differ between countries. Nevertheless, the argument that exchange rates adjust to insulate the domestic economy must be modified for the short run and for the case of capital mobility. It seems that the failure of insulation may arise from four sources : the Laursen-Metzler terms-of-trade effect, the high integration of goods markets between countries, the non-satisfaction of the purchasing power parity condition in the short run, and the mobility of capital.

Thus the Laursen-Metzler terms-of-trade effect¹⁾ on real saving, and hence on real expenditures, leads to the conclusion that expansion of economic activity in one country is accompanied by depression in other countries; from my point of view, I think that the effect of a change in terms of trade on real saving is negligible, especially when traded goods constitute a small sector in the economy. The second cause, the high integration of the goods markets, is obvious, particularly when two economies are complementary, and need not be dwelled on. The third cause stems from the fact that, according to the monetary approach, the exchange rate is determined in a general equilibrium framework and must satisfy the purchasing power parity condition, in the long run. There seems to be some evidence that the exchange rate does not fully adjust towards the purchasing power parity in the short run and the lack of goods arbitrage varies in importance between commodities. It follows that an increase in foreign prices cannot be completely compensated in the short run and is thus transmitted to the domestic economy. The fourth cause, capital mobility, rests on the working of interest

1) S. Laursen and L.A. Metzler : "Flexible Exchange Rates and the Theory of Employment", Review of Economics and Statistics, Vol. 32 November 1950, p. 281-299.

arbitrage and on the formation of expectations by speculators¹⁾ : if expectations on exchange rates lag behind current spot rates, the change in the exchange rate required to fully compensate the domestic or foreign disturbances is partly offset by capital inflow or outflow.

In addition, exchange rate changes induce real changes in the economy, resulting from the changes in relative prices of traded and non-traded goods and from the increase in the price level induced by a depreciation of the domestic currency. The changes in relative prices imply shifts of resources between the traded and non-traded goods sectors and the ensuing costs of adjustment. A depreciation of the domestic currency will increase the domestic price level through two channels : the direct upward push on import prices and the gradual adjustment of the prices of non-traded goods to the increase in the prices of traded goods. This will further contribute to domestic inflation and to the reduction of real balances. Besides these real costs of exchange rate changes on the domestic economy, other costs may arise from the greater uncertainty attached to possible large fluctuations in the exchange rates. Advocates of flexible exchange rates would claim that this uncertainty can be eliminated if traders can hedge their exchange risks in the forward markets. But the functioning of the forward markets is not without costs, because it involves the cost of information gathering and the cost of training specialists, which can be important in LDCs. Furthermore, even though exchange risks can be effectively covered, the increased price instability might reduce welfare and discourage investments.

1) Interest arbitrage and expectations are more closely investigated in the article of R. Dornbusch : "The Theory of Flexible Exchange Rates Regime and Macroeconomic Policy", The Scandinavian Journal of Economics, Vol. 78, 1976, No. 2, p. 255-275.

Thus the fixed exchange rate system, as well as the flexible exchange rates system, can entail costs to the economy, and the choice between them seems to be of a very difficult nature. Nevertheless, in examining the particular situations of LDCs, we shall try to indicate some points of reference for the choice of an appropriate policy. First, it cannot be denied that a system of flexible exchange rates ensures a greater independence of domestic economic policies and a greater insulation from foreign disturbances. Therefore, the case for flexible exchange rates is stronger, the more unstable are foreign economies; in this respect, McKinnon¹⁾ has shown that the economy of LDCs tend to be more unstable than the economy in the rest of the world. Similar to this kind of argument, one reason to justify the fixed exchange rate is the case of random disturbances : the adjustments from these random disturbances will be shared by the world community and this is preferable to the situation where large adjustments are confined to one country.

Secondly, the instability in the exchange rate may induce a greater instability in export receipts. The consequent costs that it imposes on the economy of LDCs is particularly important, when the planning of development programs depends heavily on imports, and, hence, on the financing of these imports by export receipts. Moreover, as we have mentioned above, price instability can reduce welfare and create a disincentive for investment.

Thirdly, a continuous depreciation of the domestic currency give way to more increase in the general price level. The worsening of inflation can have serious consequences, especially when the depreciation is the

1) R.I. McKinnon : "The Monetary Approach to Exchange-Rate Policy in LDCs", in H.G. Grubel and T. Morgan, ed. Exchange Rate Policy in Southeast Asia (Lexington Books, 1973), p.67-75.

result of previous domestic inflation. In a fixed exchange rate system, the depletion of the stock of foreign exchanges can constitute an efficient alarm for monetary discipline, the more so if foreign borrowing and foreign aid are limited. One can argue that the authorities can circumvent this warning by devaluing the domestic currency or by imposing trade controls; however, in LDCs, it is often found in the past that devaluation is a difficult political operation. Thus the question is whether high inflation rates or the decrease in the stock of reserves constitute a good yardstick for monetary discipline, which, in any case, is in accordance with the objective of economic growth, as we have specified above, in section II.3. It remains that the temptation to eliminate balance of payments deficits, in a regime of fixed exchange rate, by heavy trade controls can provoke undesirable misallocation of resources.

Finally, the costs of hedging exchange risks may be high for LDCs, where forward markets cannot be efficiently organized, because of the lack of adequate financial institutions and of skilled specialists.

Taking together these four points of reference, can we determine an exchange rate policy for LDCs ? It seems that the present conditions of LDCs do not allow a system of freely floating rates. But on the other hand, a regime of rigidly fixed exchange rate is not advisable either, because it can entail misallocation of resources and impose costs to the export sector. One is thus tempted to "prescribe" a compromise between the two systems. The "best" device would be that the LDCs adopt stable exchange rates, while maintaining the monetary expansion in reasonable limits, which are determined by the needs of growth. But this is rather wishful thinking, for the money supply in LDCs is often increased far beyond the "necessary" limits. In this case, the exchange rate must be adjusted, in a gliding manner or by some other practical device to be determined, to prevent the abrupt shocks of a too severe devaluation.

Turning now to the problem of exchange rate policy for LDCs in a world of floating rates, perhaps the most important factor for a choice is the stability in export receipts. First we note that foreign demand for primary products tends to be inelastic. Secondly, as the "new monetary approach" to the determination of exchange rates in a regime of flexible exchange rates has insisted upon, the exchange rate is above all the relative price of monies; thus, if the domestic economy tends to exhibit a greater rate of monetary expansion than the foreign countries, as can be expected in LDCs, the domestic currency will depreciate. The depreciation of domestic currency, coupled with an inelastic foreign demand, will decrease export receipts as a whole. It follows that in a world where key currencies are floating in terms of each other, a LDC may take advantage from pegging its domestic currency to the currency of its main importer, to guarantee stable export receipts in foreign currency. Or it may peg its currency to the currencies of many major trade partners, in a weighted average manner, the weights being compounded from the shares of exports towards each country. The second solution could avoid the bias towards imports from the country, whose currency constitutes the anchor for the domestic currency. In practice, the problem of determining appropriate weights is probably arduous and is directly linked to the problem of reserves management, which seeks to maximize yields and minimize risks in a world of generalized floating of the reserve currencies.

G.K. Helleiner¹⁾ has indicated the policies followed by most LDCs, after the disturbances of the international monetary system in 1971 and 1973. In brief, after the Smithsonian agreement on a wider band about the declared par, the sterling and franc areas nearly remained intact, and the rest of the LDCs decided to adopt the wider band; on the average, there was an effective devaluation for the LDCs with

1) G.K. Helleiner : "The LDCs and the International Monetary System", The Journal of Development Studies, Vol. 10, April/July 1974, p. 347-373.

respect to their trading partners estimated at $4\frac{1}{2}\%$. After the floating of the key currencies as the US dollar, the pound, the franc and the yen, there was a conspicuous switch in the exchange policies of LDCs : the defections were more frequent in the sterling and franc areas, which become smaller and smaller; those countries which decided to peg their currency to a major currency had done so, either formally or de facto, with respect to the US dollar; the number of the countries, which put their currencies in a flexible exchange rate regime increased by almost six times, although their total number is still small (16), including the countries which adopted the system of "adjustable peg" ; the average effective devaluation of the LDCs was about 2% . In the two periods no LDC maintained the values of their currencies in terms of the strongly appreciated currencies such as the mark or the yen.

b) Arguments for trade restrictions

It is not the purpose of this section to offer a detailed analysis of tariff and trade policies of LDCs; such a study will require a lengthy inquiry into the theoretical and practical implications of different trade policies. The arguments for trade restrictions will be examined in a context of a "general equilibrium" approach : starting from the identification of the needs of LDCs for internal growth and external balance, the role of trade restrictions in the achievement of these objectives will be investigated. Although we cannot deny the great distortions and the induced costs to the economy that trade restrictions may entail, our contention is that, due to specific conditions of LDCs , trade restrictions are sometimes a necessary tool.

Traditionnally, the purpose of tariffs or other trade restrictions measures such as multiple exchange rates, quantitative controls, are classified into three broad categories : government revenue, industrialization, balance of payments. As mentioned above, we can assign import controls an additional role, the role of equilibrating expenditures with income over time, as distinguished from its role as an

ad hoc or urgency measure to equilibrate the balance of payments. At the risk of repeating ourselves, we reemphasize here again that, given the fiscal constraint, the saving constraint, and the foreign exchange constraint, there is a tendency in LDCs for expenditures to exceed income, and, particularly, there is a tendency for an excess demand for imports, which import controls can somehow correct.

The legitimacy of the other three arguments for tariffs will be here appraised without entering into the detailed theoretical analysis underlying each of them. As we have seen earlier, the bulk of government revenue in LDCs consists of taxes on foreign trade. The tariffs on imports or the taxes on exports are easy to collect, and moreover, if some degree of self-sufficiency for the domestic economy is desired to reduce the costs of instability in foreign trade, tariffs then also contribute to reduce the amount of imports. At the present state of economic and administrative organization of LDCs, taxes on foreign trade still constitute an important source of revenue for the government and cannot be easily replaced by any other source. In addition, if a country has some monopoly-monopsony power in the world market, (there is great doubt that the LDCs are in this position), then an optimum tariff can improve its terms of trade.

Trade restrictions measures designed for correcting a balance of payments deficit may induce high costs for the economy. The resulting overvaluation of the domestic currency will penalize domestic exports, and in this case a devaluation should be preferred. Furthermore, the imported commodities which are heavily taxed or controlled may become attractive for domestic consumers, and it will be profitable for domestic producers to produce those goods for the sheltered domestic market. Thus, to avoid any misallocation of resources, the "non essential" goods, whose imports are taxed or controlled, must bear the same tax when they are produced at home. LDCs generally have a long list of "non essential" commodities whose imports are either prohibited or taxed in normal times. When a serious balance of payments

deficit occurs, some "necessary" goods can be added to this list, and this will create economic losses, if those goods are inputs for the production of export or home goods, and if a complicated system of import licenses, involving administrative costs, is built up to allocate the imports among the domestic producers. As for the ability of tariffs to bring about balance of payments equilibrium, the monetary approach¹⁾ argues that the equilibrating process works through the demand for money : the demand for money is a function of income and if the tariff proceeds are redistributed among consumers, they constitute a part of the consumers' income; thus, insofar as an increase in tariffs can raise real income, it will increase the demand for money, giving way to a process of monetary adjustment through a balance of payments surplus, which will stop when the money supply has fully adjusted to the change in money demand.

The argument of industrialization through restrictions rests on three concepts : the infant industry, the external economies, the imperfections in the labour market. The need for industrialization is derived from the need for a diversification of exports and the need for import-substitution to solve balance of payments problems. One could argue that this aspiration for more industrialization is best served by government subsidies to specific industrial sectors, for such a policy is free of the additional distortions created by tariffs. This arguments holds, if the subsidies can be financed in a "neutral" manner by taxes on other goods and if the government can effectively raise revenues for such subsidies (which is doubtful!). But it seems that, more than the height of tariffs, the structure of the tariff system is the important factor which determines the implementations of specific

1) Michael Mussa : "A Monetary Approach to Balance of Payments Analysis", Journal of Money, Credit and Banking, Vol. 6, August 1974, p. 333-351.

industries. There is some evidence, especially when the degree of effective protection is brought into light, that tariff and other protective structures in LDCs offer undue incentives for the production of consumer goods, at the expense of domestic production of capital goods or intermediate industrial inputs; any consideration of long run comparative advantage is thus neglected. The bias created by the tariff structure can somehow be corrected by taxing domestic production in the same order. The experience of import-substitution is, until now, disappointing; G.K. Helleiner has noted :

"(Import substitution) has given undue emphasis to consumer goods in most countries; it has given insufficient attention to potential long-run comparative advantage, i.e. resource endowments and learning possibilities; and it has employed alien and unsuitable, i.e. capital-intensive technologies to an extraordinary an unnecessary degree."¹⁾

Finally, if there is a desire for general protection of domestic industry in the short run, a devaluation will be preferable to a complicated system of tariff and other protective measures. As devaluation has only short run effects, it will be used if the efficiency of domestic industry can be rapidly increased. (Devaluation can also improve domestic efficiency, insofar as it induces some reallocation of resources.)

1) G.K. Helleiner : International Trade and Economic Development, (Harmondsworth, Middlesex, Penguin Books, 1972), chapter 6, p. 106.

CHAPTER III

DEVALUATION

Devaluation is the discretionary change of the exchange rate by the government in a regime of fixed exchange rate. In a world of floating exchange rates, therefore, the analysis of devaluation seems to be misplaced. However, such an analysis is still relevant for several reasons. First, the present international monetary system is mostly a system of controlled floating rates; exchange rates do not fluctuate freely to keep the balance of payments always in equilibrium, and government intervention in the exchange markets remains more or less important. Second, as the study of Helleiner¹⁾ has shown, most of LDCs still peg their exchange rate to a major currency; devaluation, then, would imply a change in the value of the peg with respect to the major currency. Third, devaluation has the same effect on the price level as an autonomous depreciation of the exchange rate in a regime of flexible rates (though under flexible rates the question often turns on the effect of a change in the price level on the exchange rate).

The problem of devaluation cannot be analyzed without a reference to existing theories; the first section of this chapter will give a review of the well-known theories of devaluation with, if possible, some special considerations for LDCs. The effect of a change in the exchange rate on the price level will be examined in the second section. This problem is similar to the problem of imported inflation with the difference, however, that devaluation corresponds to a once-and-for-all

1) Helleiner : "The LDCs and the International Monetary System", op. cit.

change in the level of foreign prices. Thus the effect of devaluation on the price level is best tackled if one works with price levels, as we have done in our "monetary model with expectations" of chapter I. Finally, the existence of trade controls implies some modifications of the analysis of devaluation and that will be done in the third section of this chapter.

III.1. A review of the theories, with special considerations of LDCs

There is a vast literature on the subject of devaluation; therefore, undertaking a review of the existing theories is at the same time an easy and a risky matter. The task is easy, because the path is already laid out, but the risk, then, is to get trapped in the routine and to offer the reader something "already seen and already heard". Nevertheless, the review is useful in that it serves as a background for an empirical analysis of devaluation. In this section, a critical exposition of each approach to devaluation will be undertaken. Capital flows will be neglected, and in what follows the balance of payments is identical to the balance of trade.

III.1.1. The Elasticity Approach

In the elasticity approach, the condition of stability in the foreign exchange market determines the condition under which devaluation can improve the balance of payments, for exports correspond to the supply of foreign exchange and imports to the demand for foreign exchange. In turn, this stability condition can be expressed in terms of elasticities of (domestic and foreign) demands for imports and of (domestic and foreign) supplies of exports. The second point of interest is that, depending again on the specific elasticities, the balance of payments in terms of foreign currency can deteriorate, even if the balance of payments in terms of domestic currency can be improved by devaluation.

The stability condition can be derived from the balance of payments equation, which is the difference between the value of exports and the value of imports, and from the elasticities of the supply of and the demand for imports and exports with respect to their prices in the respective currencies of the sellers and the buyers. The two complete formulae¹⁾ of the condition for an improvement in the balance of payments in domestic and foreign currency are found to be :

- (1) for the balance of payments in domestic currency (the Robinson-Metzler condition)

$$X \frac{\eta_x (1 + \epsilon_x)}{\eta_x + \epsilon_x} - I \frac{\epsilon_m (1 - \eta_m)}{\eta_m + \epsilon_m} > 0$$

- (2) for the balance of payments in foreign currency

$$X \frac{\epsilon_x (\eta_x - 1)}{\eta_x + \epsilon_x} - I \frac{\eta_m (\epsilon_m + 1)}{\eta_m - \epsilon_m} > 0$$

where : X = value of exports in domestic currency before devaluation
 I = value of imports in domestic currency before devaluation
 η_x = foreign elasticity of demand for exports
 ϵ_x = domestic elasticity of supply of exports
 η_m = domestic elasticity of demand for imports
 ϵ_m = foreign elasticity of supply of imports

1) For the derivation of these formulae, see for instance : G. Haberler : "The Market for Foreign Exchange and the Stability of the Balance of Payments : A Theoretical Analysis", reprinted in R.N. Cooper, ed. : International Finance (Penguin Books, 1969), chapter 5, p. 107-134.

If the balance of payments is in equilibrium before the devaluation and if the elasticities of supply tend towards infinity, the condition for stability is the same for the two kinds of balance of payments and is known as the Marshall-Lerner condition. This condition states that the sum of the demand elasticities must exceed unity, that is $(\eta_x + \eta_m - 1) > 0$. It has led to an elasticity pessimism, whose advocates believed that the balance of payments cannot be improved by devaluation because of the low values of elasticities. It must be noticed, however, that the long run elasticities can be greater than the short run elasticities, implying thus that the time length of the adjustment of the balance of payments must be taken into consideration. It must be also mentioned that nothing is said about a return to equilibrium which means that the balance of payments can be permanently improved.

The elasticity approach has often been attacked on the ground that it is a "partial equilibrium" approach, in the sense that only foreign trade sector is considered with no attention paid to changes in income and prices induced by devaluation. More recently, works carried out in a general equilibrium framework have clarified the criticisms and have shown the main characteristics and shortcomings of the elasticity approach.

Thus, the Marshall-Lerner condition can be considered as the stability condition of a barter world economy of two countries and two goods, in which money has no active role and all income is spent on physical goods. As the two countries produce and consume both goods, the import by one country of one good is its excess demand for this good and its export of the other good is its excess supply of this good. The consumption functions depend on the terms of trade of the two goods, or their relative price, and on real income; the production functions depend on the terms of trade alone. Assuming that one country imports a specific good and exports the other good, the Marshall-Lerner condition is then the condition under which the balance of payments of the country

improves when the relative price of the two goods is changed¹⁾. This analysis clearly points out one weakness of the Marshall-Lerner condition : the terms of trade or relative price of the two goods is identified as the exchange rate. The exchange rate is the relative price of two currencies, hence it cannot be determined without introducing money in the model.

The Marshall-Lerner condition can also be derived from a "Keynesian" model, where the balance of payments is equal to the difference between income and expenditure and where each country specializes in the production of exportables with the additional assumptions of constant income and domestic prices, implying thus some non-neutral monetary policy²⁾.

Similarly, the more general Robinson-Metzler condition can be obtained

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- 1) A modified Marshall-Lerner condition can be found in : Akira Takayama : International Trade, An Approach to the Theory (New-York, Holt, Rinehart and Winston, Inc., 1970), chapter 8, Part III. Taking into account the elasticities of import demand η_d and η_f (the subscripts d and f refer to domestic and foreign economy), the elasticities of export supplies ε_d and ε_f and the propensities to consume π_d and π_f , the modified Marshall-Lerner condition is :

$$[(\eta_d + \varepsilon_d + \pi_d) + (\eta_f + \varepsilon_f + \pi_f) - 1] > 0$$

- 2) By non-neutral monetary policy is meant a monetary policy that assures internal balance. See : A.C. Harberger : "Currency Depreciation Income and the Balance of Trade", Journal of Political Economy, Vol. 58, February 1950, p. 47-60, and S.C. Tsiang : "The Role of Money in Trade Balance Stability : Synthesis of the Elasticity and Absorption Approaches", reprinted in R.N. Cooper, ed. : International Finance, chapter 6, p. 135-161.

in a model of two countries and three goods, which consist now of two real goods and money. Negishi¹⁾ has shown that the Robinson-Metzler condition requires the imposition of two assumptions : neutral monetary policy and zero cross price effect. (The Marshall-Lerner condition can be derived from the Robinson-Metzler condition by assuming that the balance of payments is initially in equilibrium). With the condition that the world markets for the two goods are in equilibrium, the balance of payments of one country is equal to the world excess demand for its currency. If it is further assumed that the overall domestic money supply is maintained constant (neutral monetary policy) and that any cross price effect on the excess demands for goods is ignored, the Hickian stability condition of the system formed by the two equilibrated markets of goods and the world excess demand for domestic currency is found to be the Robinson-Metzler condition.

In conclusion, the elasticity approach is essentially an analysis of flows of funds. The stability of the foreign exchange market is investigated by considering the functions of the flow demand and supply of foreign exchange. Therefore no mechanism for a return to a stock equilibrium is indicated, permitting thus a permanent disequilibrium in the balance of payments. The second shortcoming of this approach is to confuse the exchange rate with the relative price of goods, at least as is implied by the Marshall-Lerner condition. Thus the elasticity approach fails in identifying the exchange rate as the relative price of two currencies and it ignores the role of non-traded goods in the adjustment process. Thirdly, the "partial equilibrium" aspect of this approach results from its assumption of constant domestic price and income²⁾. And finally, this approach does not take into consideration

1) T. Negishi : "Approaches to the Analysis of Devaluation", International Economic Review, Vol. 9, June 1968, p. 218-227.

2) Although Negishi, op. cit., has shown that this assumption is sufficient but not necessary for the Robinson-Metzler condition to hold; in his model the latter is obtained with the assumption of zero cross price effect.

monetary factors.

III.1.2. The Absorption Approach

In his attack against the "partial equilibrium" aspect of the elasticity approach, Alexander¹⁾ proposed an analysis of the balance of payments starting from the national income account identity. It is known as the "absorption approach" and it relates the balance of payments to the income and expenditures functions of an economy.

The national income account identity states : $B = Y - A$, where $B = X - IM$ and $A = C + I$ (with the following notations : B = balance of payments, Y = income, A = absorption, X = exports, IM = imports, C = consumption, I = investment).

Let the small letters denote the changes in these quantities : $b = y - a$. a is decomposed into two components : an induced change in absorption due to the change in income, cy , where c is the marginal propensity to spend, and an autonomous change in absorption, d . Thus $a = cy + d$ and $b = (1 - c) y - d$, where $(1 - c)$ is the propensity to hoard.

From this one can see that the balance of payments can be improved if income can be increased or absorption decreased. If the economy is underemployed, then income can be increased and the balance of payments would be improved provided that the propensity to hoard is positive. If the economy is in full employment, income cannot be increased, and the balance of payments could be improved if and only if absorption is reduced. Among the direct reducing effects of devaluation on absorption, Alexander mentioned the cash-balance effect, the redistribution of income and money illusion. He also added that under conditions of full employment, the direct

1) Sidney S. Alexander : "Effects of a devaluation on a Trade Balance", IMF Staff Papers, Vol. 2 April 1952, p. 263-278.

effects of devaluation may be weak; thus, to improve the balance of payments, reduction in absorption must be stimulated by government policies.

The merit of the absorption approach is to make clear the relationship between the balance of payments and the income and expenditure of the economy as a whole, and to analyze both underemployment and full employment situations. It also contains the first hints on monetary factors, such as the cash-balance effect and on the policy implications for the balance of payments adjustment. However, there is one important point that Alexander omitted : the mechanism by which income can be increased by devaluation under the condition of underemployment.

Johnson¹⁾ extended the analysis of Alexander and emphasized two important points which pave the way for later research on the balance of payments : the distinction between the stock and flow disequilibrium of the balance of payments and the nature of policies which can be expenditure-switching or expenditure-reducing.

The absorption approach is still a flow analysis. Under conditions of unemployment, devaluation can increase income via the favorable impact on the balance of payments (which is subject to the fulfilment of the elasticities conditions). Under full employment, devaluation cannot improve the balance of payments unless expenditures are reduced either by the direct effects of devaluation or by deliberate policies.

1) H.G. Johnson : "Towards a General Theory of the Balance of Payments", in H.G. Johnson International Trade and Economic Growth : Studies in Pure Theory (Cambridge : Harvard University Press, 1961).
p. 153-168.

III.1.3. The Income Approach : A Synthesis of the Elasticity and Absorption Approaches

One way to reconcile the elasticity and the absorption approaches is to consider the effect of devaluation on the balance of payments, in the case of the fulfilment of the elasticities conditions, as an initial effect. A multiplier is then applied on this initial effect, which will dampen it. The determination of this multiplier depends on some specific assumptions, such as variable production and variable or constant domestic prices. The ultimate effect on the balance of payments is smaller than the initial effect. In a two-country, two-commodity model, with expenditure and import functions depending on income and domestic and import prices, the increase in income due to a favorable initial effect will induce an increase in spending on domestic and imported goods in the devaluing country; the contrary being the case of the foreign country. However, provided that the propensities to hoard of the two countries are positive, the multiplier effect dampens but does not reverse the initial effect. For the balance of payments to improve, Tsiang¹⁾ has found that the critical value for the demand elasticities is unity minus the sum of the domestic and foreign marginal propensities to spend on imports.

The merit of this analysis is to allow for an effect of devaluation on real output, but it still ignores monetary factors, for the implicit assumption is that either the economy is in a liquidity trap, or investment and savings are interest inelastic, or the interest is kept constant by an infinitely elastic money supply. Moreover, the wealth effect is ignored and the situation of full employment is not satisfactorily treated.

1) Tsiang, op.cit.

III.1.4. The Monetary Approach

The monetary approach regards the balance of payments problem as essentially a monetary phenomenon, resulting from the excess demand for or supply of money. Although the role of the demand for and the supply of money is crucial in determining the balance of payments, relative prices are not ignored and are incorporated in the adjustment process. We shall consider three versions of the monetary approach in order to show clearly the role of the real balance effect and of relative price changes in the adjustment process. The first and simplest version assumes a one-commodity world with fixed supply of output; the second version splits the commodity market into two sub-markets, one for traded goods and one for non-traded goods; and the third version assumes also two commodities, but distinguishes between import and export goods. All three versions assume price flexibility and their common element is, of course, the demand for money.

Thus, in a model with only one commodity¹⁾, whose price in foreign currency is imposed upon our small country, emphasis is put upon the real balance effect in the balance of payments adjustment process.

For simplicity, assume that the demand for nominal money balances is of the form :

$$M^d = k P \bar{y} \quad , \quad \text{where } \bar{y} = \text{fixed supply of output} \quad (1a)$$

The budget constraint implies that money income minus money expenditure must equal hoarding, which is identical to the balance of payments :

1) See for instance : R. Dornbusch : "Devaluation, Money and Non-traded Goods", American Economic Review, Vol. 73, December 1973, p. 871-880.

$$Y - E = H = B \quad (2a)$$

Hoarding in turn, is an adjustment function of the demand for and supply of money, rising when the demand for money is greater than the supply, and falling when the supply exceeds the demand :

$$H = \alpha (M^d - M) \quad (3a)$$

The arbitrage in the goods market assures that the domestic price of the commodity is equal to its foreign price, P^* , assumed to be fixed, multiplied by the exchange rate, e :

$$P = P^*e \quad (4a)$$

Furthermore, the change in the money supply results only from the balance of payments, or, in other words, there is only outside reserve currency :

$$\dot{M} = B \quad (5a)$$

Devaluation will increase the domestic price level and, consequently, the demand for nominal money balances and hoarding. The balance of payments is improved, via the real balance effect, but this improvement is not permanent, since it is accompanied by an increase in the money supply, which will restore the equilibrium in the money market.

Now, we introduce a second commodity¹⁾, which is the non-traded good.

1) See for instance : A.O. Krueger : "The Role of Home Goods and Money in Exchange Rate Adjustments", in W. Sellelearts, ed. : International Trade and Finance : Essays in Honor of Jan Tinbergen (White Plains, New-York : International Arts and Sciences, 1974), p. 141-161.

It will be seen that the equilibrium in the three markets (traded good, non-traded good, money) depends on the relative price of traded and non-traded goods and the supply of money. Let good 1 be the traded good, whose price P_1^* in foreign currency is given (the domestic price being P_1), and good 2 be the non-traded good and P_2 its price.

We consider first the markets of real goods. The production functions depend on the relative price of traded to non-traded goods and are homogeneous of degree zero in P_1 and P_2 :

$$\begin{aligned} X_i &= X_i(P_1/P_2) & i &= 1, 2 \\ \partial X_1 / \partial (P_1/P_2) &> 0 & \partial X_2 / \partial (P_1/P_2) &> 0 \end{aligned} \quad (1b)$$

By the separability assumption between goods and money¹⁾, the demand for commodities can be expressed as a function of P_1 , P_2 and money expenditure on commodities :

$$C_i = C_i(P_1, P_2, E) \quad i = 1, 2 \quad (2b)$$

Again, the difference between money income and money expenditure is equal to hoarding, which is the same function as before :

$$\begin{aligned} E &= Y - H & \text{and} & & H &= \alpha(M^d - M) \\ \text{or } \sum P_i C_i &= \sum P_i X_i - \alpha(M^d - M) & i &= 1, 2 \end{aligned}$$

Hence, excess demand functions for commodities can be written as follows :

$$E_i = C_i - X_i = E_i(P_1, P_2, M - M^d) \quad i = 1, 2 \quad (3b)$$

1) For a brief and clear exposition of the separability assumption, in connection with the derivation of the demand for real goods, see Takayama, op.cit., chapter 9, appendix.

Next, the demand for money is homogenous of degree one in P_1, P_2 :

$$M^d = M^d(P_1, P_2) \quad \text{with} \quad \partial M^d / \partial P_i > 0, \quad i = 1, 2 \quad (4b)$$

The budget constraint is, as before :

$$Y - E = H \quad \text{or} \quad - \sum_i P_i E_i = H \quad i = 1, 2 \quad (5b)$$

Finally, the domestic price of the traded good is linked to the foreign price by the arbitrage condition :

$$P_1 = e P_1^* \quad (6b)$$

The economy will be in full equilibrium when the flow markets of commodities and the stock money market are all in equilibrium : $E_2 = 0$ and $M^d = M$. (By the budget constraint, one market can be ignored), We note by passing that the excess demand functions can be written as :

$$E_i = E_i(P_1, P_2, M) .$$

The two conditions $E_2 = 0$ and $E_1 = 0$ (or $M = M^d$) are then used to determine the equilibrium values of P_2 , e , M . The system is under-determined, however, and a variable must be exogenously fixed. We shall assume that P_2 is flexible to clear the market for the non-traded good, consequently, either e or M must be exogenous. In a system of fixed exchange rate, e is exogenously fixed and M is endogenously determined. In a system of flexible exchange rates, M is exogenous and e is determined by the system. Furthermore, the homogeneity properties of the excess demand functions imply that, in equilibrium positions, an increase in one exogenous variable must induce a proportionate increase in the other endogenous variables¹⁾. It follows that

1) Anne D. Krueger, *op.cit.*, has noted the symmetry between e and M and their proportionate adjustments.

in a system of fixed exchange rate, there is but one equilibrium relative price of traded to non-traded goods and one equilibrium stock of money.

But a short run flow equilibrium can exist, when the market for the non-traded good is cleared and domestic excess demand for the traded good is satisfied by running a balance of trade deficit and exporting money. This is characterized by the two conditions : $E_2 = 0$ and $-P_1 E_1 = H = B = \dot{M}$.

The balance of trade deficit is thus seen as essentially a monetary phenomenon because an excess demand for the traded good is exactly matched by an excess supply of money. Devaluation, by raising P_1 , will bring about two principal impact effects : 1) It will raise the demand for money, thus partly eliminating the excess supply of money; 2) It will lower the relative price of the non-traded good. These two effects will work on the excess demand for the traded good, creating unambiguously a trade balance surplus. The increase in the demand for money will reduce expenditure relative to income, the decrease in the relative price of the non-traded good will channel the demand for real goods towards this sector, but will divert production from it. In the short run then, a reallocation of resources will occur. But as time passes, the balance of payments surplus will increase the money supply, which will increase expenditure and, hence, the price of non-traded goods. In long run full equilibrium, the money market will be in equilibrium and so will be the market for each good.

The above analysis can be clearly illustrated by the diagram borrowed from Mundell¹⁾, where the line DD represents the equilibrium locus of

1) R. Mundell : Monetary Theory : Inflation, Interest and Growth in the World Economy (Pacific Palisades, California : Goodyear, 1971), chapter 9 : Devaluation.

the market for non-traded goods, the line II the equilibrium locus of the market for traded goods, and the line MM the equilibrium locus of the money market. The vertical axis measures the price of non-traded goods and the horizontal axis the price of traded goods.

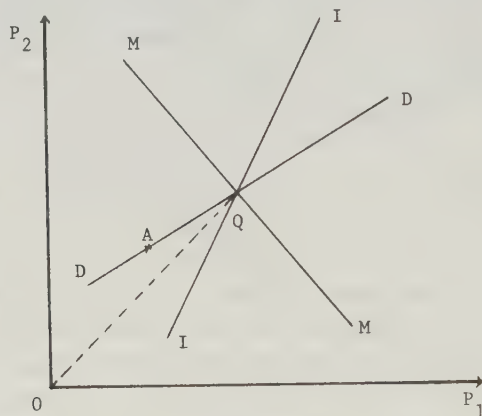


FIGURE 6

Point Q is a long run equilibrium point where all markets are in equilibrium. Point A is our short run flow equilibrium, where the market of non-traded goods is in equilibrium and the excess demand for traded goods is matched by an excess supply of money. It is clearly seen that the trade deficit at point A results from two sources : 1) a disequilibrium relative price P_2/P_1 (the relative price of non-traded goods is too high), and 2) a disequilibrium in the money market. Point A cannot be a stable equilibrium point. If no policy action is taken, the trade deficit will diminish the excess money supply, creating temporary excess supply of non-traded goods, which will be eliminated by a change in P_2 . Thus, the relative price P_1/P_2 will change, excess money supply will be eliminated by trade deficit and this will finally lead to point Q, which is a full equilibrium point. Devaluation can accelerate this process, by raising money demand and by lowering the relative price of the non-traded goods. Thus devaluation at a point like A implies that real variables like the relative price is changed, while devaluation at a full

equilibrium point like Q leads to no change in real magnitudes. This follows from the homogeneity properties of the excess demand functions. The path from A to Q cannot be clearly traced. It depends on the substitution effect on consumption and production, on the real balance effect and also on the "expectations effect".

The third version of the monetary approach takes into account only internationally traded goods and inquires into the effects of devaluation on the terms of trade and on the balance of payments. The two most famous articles which illustrate this case are the articles of Kemp¹⁾ and Dornbusch²⁾. In particular, Dornbusch has highlighted the role of the real balance effect in reducing expenditure and the role of relative price changes to clear each commodity's market in each country. However the two effects cannot be so clearly distinguished, for there is a feedback effect of relative price changes on hoarding. Kemp has demonstrated the equivalence of the three measures, equiproportionate devaluation of the home currency, expansion of the foreign money supply and curtailment of the home money supply, as for their effects on the terms of trade and on the balance of payments.

The structure of the model of this third version is the same as for the preceding model with non-traded goods, the approach is one of general equilibrium. The only difference is that, while in the preceding model, the absolute price of the non-traded good remains unchanged in the period immediately following devaluation, and, hence, its relative

1) M. Kemp : "The Balance of Payments and the Terms of Trade in Relation to Financial Controls", Review of Economic Studies, Vol. 37, January 1970, p. 25-32.

2) R. Dornbusch : "Currency Depreciation, Hoarding and Relative Prices", Journal of Political Economy, Vol. 81, July/August 1973, p. 893-915.

price declines, in the case where the two goods are both traded, one good being an exportable good and the other an importable, the direction of change in the terms of trade depends on specific conditions. We shall give here a brief summary of the conclusions drawn by Kemp and Dornbusch, given the assumptions that the commodities are gross substitutes for each other and for money, and that the marginal propensities to spend on each commodity are positive, and given the usual homogeneity properties of the excess demand functions :

- Devaluation in the home currency will lead to an increase in the prices of both goods in terms of domestic currency, but their increase is proportionately less than the rate of depreciation;
- The prices of the commodities in foreign currency will decline correspondingly, but proportionately less than the rate of depreciation;
- The rise in domestic prices and the decrease in foreign prices will induce a balance of payments surplus in the home country (or an increase in hoarding) and a balance of payments deficit in the foreign country (or dishoarding);
- In addition, provided that the Marshall-Lerner condition holds, the home country's terms of trade will improve or deteriorate, depending on whether the foreign marginal propensity to spend on the home country's exportables exceeds or falls short of the domestic propensity to spend on that commodity.

At this stage, it may be worthwhile to summarize briefly the main points emphasized by the three approaches :

1. The elasticity approach focuses on the role of relative price changes and on the induced substitution of consumption and production of imports and exports. The condition for an improvement in the balance of payments depends on specific values of the elasticities. In particular, when the supply elasticities of exports are infinite, the Marshall-Lerner condition of stability states that the sum of the domestic and foreign elasticities of demand for imports must be greater than one for devaluation to improve the balance of payments.

This flow analysis allows a permanent improvement in the balance of payments.

2. The absorption approach places stress on the functioning of the over-all economy and, thereby, on the identity : $B = Y - E$. In the case of underemployment of factors of production, real output can be easily increased and the balance of payments is improved by devaluation, provided that the marginal propensity to hoard is positive. In the case of full employment, an improvement in the balance of payments is obtained by a reduction of expenditures, which can be brought about by such factors as the cash-balance effect, money illusion, income redistribution or deliberate government policies.
3. The monetary approach emphasizes the role of money demand and supply in determining the balance of payments; real factors such as income and real interest rate can influence the balance of payments through the demand for money. Devaluation, by raising the domestic price level, will unambiguously induce a balance of payments surplus or, equivalently, an increase in hoarding, as people attempts to rebuild their real cash balances. But the improvement in the balance of payments is only temporary and, in the long run, where stock and flow markets are all in equilibrium, the balance of payments is also in equilibrium. Relative prices play an important role in the adjustment process of each country's individual commodity market and their changes will influence, in turn, the rate of hoarding. Another feature concerning economic policies is also pointed out, that is the equivalence between devaluation of domestic currency and the reduction of the domestic money supply, as for their effects on the balance of payments.

The last approach is perhaps the most complete of the three, for it incorporates an expenditure effect and an effect of relative price changes on the substitution of consumption and production. This may explain the fact that empirical studies on devaluation have demonstrated the good performance of the monetary approach.

In particular Genberg¹⁾, in a cross-section empirical analysis of devaluation, has found that the monetary approach is superior to the other approaches in explaining the consequences of devaluation on the overall balance of payments in seventeen countries.

For the LDCs, devaluation may be an efficient economic instrument (although not a politically secure one²⁾, especially because of the price increase that it entails and perhaps because of the prestige attached to the stability of the value of domestic currency). It induces an expenditure-reducing and an expenditure-switching effects and a necessary reallocation of resources. Generally speaking, if devaluation occurs in a situation of open deficit, it will induce, in the short run, a substitution of consumption from the traded sector towards the non-traded sector, and from the importables towards the exportables. Along with substitution in consumption, there will be a switch of production towards traded goods. The reduction in domestic expenditure, which arises from the real-balance effect and from some other effects, such as the redistribution effect, mentioned in the absorption approach, may entail a slump in the domestic economy. This could occur if the proper substitution of production fails to work because, for example, of the short run immobility of factors of production.

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- 1) Hans Genberg : "An Empirical Comparaison of Alternative Models of Currency Devaluation", National Economic Policies and the International Monetary System, No. 3, Graduate Institute of International Studies, Geneva, November 1974 .
 - 2) R.N. Cooper has found that "devaluation - or the policies that led to the need for devaluation or the policies that followed it - roughly doubles the chance that a ruling group will be removed from power"; see R.N. Cooper : An Analysis of Currency Devaluation in Developing Countries", in Michael B. Connolly and Alexander K. Swoboda, ed. : International Trade and Money (London, George Allen and Urwin, Ltd. 1973), p. 167-196.

In most of the cases the LDCs devalue from an inflationary situation, accompanied by a balance of payments deficit, which is more or less suppressed by trade restrictions measures. The analysis, then, can differ from the situation of open deficit and will be more closely examined in section III.3. For the moment, we shall try to see what are the general implications of exchange controls on the expenditure and substitution effects of a devaluation which is accompanied by the elimination of trade restrictions measures. If the country is small and has no influence on the price of its exports and imports and if the rate of devaluation is exactly equal to the tariff rate imposed on imports, or its equivalent, then devaluation will automatically increase the domestic price of exportables relative both to the price of importables on one hand (assuming for simplicity that the domestic price of imports remains unchanged after the liberalization of imports), and to the price of non-traded goods. In this case, if the share of exports in domestic expenditure is negligible, the reduction of expenditure via the real balance effect may also be negligible, and there may be a balance of payments deficit, resulting from increased imports after their liberalization. (Imports can be increased by a forced reduction in savings.) Nevertheless, there may be substitution of production towards the export sector and the resources will be consequently more efficiently allocated. These remarks throw some light on the importance of the choice of an "equilibrium" exchange rate, which is associated with the concept of the shadow exchange rate which will be later examined. The rate of devaluation must be larger than the tariff rate or its equivalent to engender successful reduction in expenditure and successful substitution effects.

The case where the country is specialized in its exports and, therefore, has some control on their price is slightly more complicated. The devaluation at a rate equivalent to the rate of import restrictions will probably leave the domestic price of imports unchanged, but the price in foreign currency of exports will be lowered. If the foreign demand for exports is elastic, then exports will increase. The price of exports will remain unchanged or will increase, depending on whether there is

excess capacity or not in this sector. In the case of excess capacity, output and employment will expand, but there will be no reallocation of resources.

III.2. Devaluation and the price level

In the absence of any trade restrictions, the impact effect of devaluation is a boost in the prices of traded goods, or at least of imports. The mechanism by which the price increase is transmitted to the non-traded sector and, therefore, to the overall economy is analyzed in this section. The links in the chain of transmission are represented by non-traded goods and domestic expenditure. With respect to the analysis of the effect of devaluation on the price level, this section will discuss two main lines : an income (Keynesian) approach and a monetary approach. The first one stresses the effects of devaluation on national income and on the substitution of consumption and production between the different goods, while the second one relies more on monetary factors to describe the transmission mechanism, although it also takes into account the substitution effects on consumption and production.

III.2.1. The income approach

Instead of elaborating some "Keynesian" models to illustrate this approach, we shall give here a brief exposition of two articles¹⁾ by Fleming and Harberger, which are the most representative of this line

1) J. Marcus Fleming : "Exchange Depreciation Financial Policies and the Domestic Price Level", IMF Staff Papers, Vol. 6, April 1958, p. 288-322; Arnold C. Harberger : "Some Notes on Inflation", in Werner Baer and Isaac Kerstenetzky, ed. : Inflation and Growth in Latin America (Homewood, Illinois, R.D. Irwin, Inc., 1964), p. 319-351.

of analysis. The spirit of these two articles will be sketched in broad lines in order to point out the main characteristics. It is interesting to note that both recommend an economic policy (taxation or monetary policy), which tends to reduce expenditure in the period following devaluation. The effect of devaluation on the price level works through two main channels : the price elasticities of demand for and supply of the different goods, and the marginal propensities to spend on these goods; the second mechanism is conditioned by the effect of devaluation on the balance of trade and, hence, on national income and expenditure.

To take first the analysis of Fleming, there are three kinds of goods : import and export goods, which are both domestically consumed and produced, and non-traded goods. Considering only the elasticities relevant to the export and import sectors, by imposing the assumption that an "appropriate financial policy" will keep the price of non-traded goods constant, devaluation will have an influence on income and expenditure, to the extent that the balance of trade is improved.

The price of imports will rise first, but probably by less than the rate of exchange depreciation. The magnitude of the price increase of import goods depends on the price elasticity of the domestic demand for imports, the price elasticity of the foreign supply of imports, and also the price elasticity of the domestic supply of import substitutes. The price of exports will also rise and the magnitude of this price increase depends on the price elasticity of foreign demand for exports and the price elasticity of net domestic supply of exports. The rise in the domestic general price level will be smaller, the lower the elasticities abroad and the higher the elasticities at home. Furthermore, the extent to which the domestic price level will rise depends also on the share of traded goods in domestic total expenditure.

A secondary price increase may occur because of the improvement in the balance of trade ; it works through the marginal propensities to buy import and export goods. The improvement in the balance of trade is more likely, the larger are the home and foreign elasticities of demand and

supply for imports and exports, and the larger are the income elasticities of demand for import and export goods in the home country. It is worth noting that these conditions are very similar to the conditions imposed by Tsiang, that we have earlier mentioned. It follows that in order to dampen the price effect of devaluation, expenditure must be somehow reduced.

This analysis leaves open several issues. First, the kind of financial policy which makes the price of home traded goods unaffected cannot be clearly figured out, because, if anything, of the interconnections between traded and non-traded goods in the production process. Second, the analysis on the expenditure effect of devaluation is unsatisfactory, for no explicit link between expenditures and the balance of trade is traced out. And finally, no account is taken of the monetary factors. Nevertheless some general features of a possible transmission process can be grasped and attention is paid to the non-traded goods sector, to the extent that the elasticities of demand and supply for export and import goods also depend on the substitution in consumption between traded and non-traded goods and on the mobility of factors of production between these two sectors.

Harberger's analysis drops the assumption of constant price of non-traded goods and, instead concentrates on the effect of devaluation on this price. In his model, there are two kinds of goods : internationally traded goods, whose price is exogenously fixed, and non-traded goods. There is unemployment; the money wage is downwardly rigid; the demand for goods is a function of real income and relative prices; and the supply of goods is a function of their absolute prices. In addition to these Keynesian assumptions, on the monetary side, an infinitely elastic money supply, which accomodate any change in the demand for money, is also assumed. The effect of devaluation on the domestic price level is unambiguously positive and its magnitude depends on the price elasticities of supply of international and home goods and on the marginal propensities to consume . Some strong results are stated. If the price

elasticity of the supply of domestic goods is infinitely elastic, there is no repercussion of devaluation on the domestic price level. There are two cases in which the increase in the price of domestic goods is proportionately equal to the increase in the price of international goods (i.e. the rate of devaluation) : the case where the price elasticities of the supplies of international and domestic goods are zero, as might occur when there is no short run resources mobility between these two sectors, and the case where the marginal propensities to consume domestic and international goods are proportionate to their price elasticities of supply. Finally, the effect of devaluation on the domestic price level is stronger, the higher the marginal propensity to consume domestic goods and the higher the price elasticity of the supply of international goods. Harberger also recommends an increase in taxation to reduce expenditure and, thereby, to reduce the price effects of devaluation.

The elements of the transmission process within the income approach are now clearly discernible. The price elasticities of the demand for and the supply of international and domestic goods, which are in some measure influenced by the substitution of consumption between these two goods and by the resources mobility between these two sectors, determine the size of the price effect of devaluation. In Harberger's model, the process can be simply described as follows. The rise in the price of international goods induces on one hand, an increase in their supply and on the other hand, an increase in the demand for domestic goods. If the price elasticity of the supply of international goods is high enough, this sector will attract resources from the non-traded goods sector, thus bidding up wages. The increased demand for non-traded goods, in the face of a rigid or reduced supply, will in turn raise their price. Further more, under conditions of underemployment, the improvement in the balance of trade will increase income and, hence, expenditures, which will put secondary upward pressures on prices. Under conditions of full employment, one can expect that the price effects of devaluation will be much stronger because, in this case, there is no increase in real output.

III.2.2. The monetary approach

While the preceding approach completely neglects the role of monetary factors, the monetary approach emphasizes the monetary effects of devaluation in the process of adjustment. The general features of the transmission mechanism can be outlined by referring back to the second model of the monetary approach of section III.1.4. The time path followed by the domestic price level after a devaluation can then be drawn by the monetary approach with expectations of the first chapter.

In the two-goods (traded and non-traded) model of section III.1.4, we have seen that the effect of devaluation on the relative price can differ, depending on whether devaluation takes place from a full equilibrium position or from a position of external trade deficit. In the first case, there will be no change in the equilibrium relative price in the final state when full adjustment has taken place. The price of non-traded goods, therefore, must increase by the same amount as the rate of devaluation. In the second case, the trade deficit arises from an excess money supply and from a disequilibrium relative price which is characterized by a high price of non-traded goods relative to the price of traded goods. It follows that, if the adjustment after a devaluation leads to a final full equilibrium position, where excess money supply is eliminated and the equilibrium relative price is obtained, the relative price will then be altered and the price of the non-traded good will increase, but proportionately by less than the rate of devaluation.

After these preliminary remarks, we are now ready to describe in its generality the transmission process of a once-and-for-all increase in the price of traded goods. Devaluation, by pushing up the price of traded goods, will raise the general price level. This will increase the demand for money and, hence, hoarding, via the real balance effect. As a result, expenditure will be cut down and the price level of domestic goods may decrease. However, there will also be a substitution effect on the

consumption side, raising the demand for non-traded goods, while on the production side resources will be mobilized away from the non-traded sector. As a consequence, the price of non-traded goods will be driven up and so will be the general price level. Thus the first impact effect of devaluation on the price of home goods depends on the outcome of the interaction of two forces : if the real balance effect prevails over the substitution effect , then the price of the non-traded goods will initially decrease; if the contrary occurs, the price of the non-traded goods will initially rise. In the long run, the balance of payments surplus will bring about an increase in the money supply and, hence, an increase in expenditures relative to the situation immediately following devaluation. At the end, the domestic price level will increase, by an amount equal to or less than the rate of devaluation depending upon the circumstances mentioned above.

It must be noted that the share of traded and non-traded goods in the overall domestic expenditure is also of importance for the effect on the general price level . If, for example, the share of non-traded goods is negligible, then the change in their price will have a negligible influence on the general price level.

Thus the focus of the monetary approach is on the monetary factors which constitute the main elements in the transmission process. The impact effect of devaluation is to some extent determined by the real balance effect which creates a balance of payments surplus. The balance of payments surplus will, in turn, permit a rebuilding of real balances, on which depends the final increase in the domestic price level. However, the time path of the adjustment of the domestic price level might be quite complex. Several alternatives might occur : in the short run, the domestic price level could overshoot its long run equilibrium level; it could decrease; it could climb up smoothly towards its long run level; or finally, the three possible time paths just described might not be smooth but oscillatory! This was carefully analyzed in section I.2.3. of the first chapter within the monetary model with expectations. Now

it suffices to set up again the main conclusions with respect to the domestic price level.

It is worthwhile to recall that the effects of devaluation on the domestic price level consist of both an impact effect and a long run effect. The impact effect has three components : a substitution effect, a liquidity effect and an expectations effect. As was earlier shown, the substitution effect drives the domestic price level up. The expectations effect works in the same direction and can be explained by the fact that the public by anticipating a price increase induced by devaluation, will hasten to purchase real goods. The liquidity effect can be negative if the effect of devaluation on the demand for money is strong enough. Thus the impact effect can be either negative or positive. In the positive case, the conjunction of substitution and expectations effects can exert a strong pressure in the upward direction on the domestic price level. In all cases, however, the long run effect of devaluation on the domestic price level is unambiguously positive. The time path of the domestic price level depends on the sign of the impact effect and on the relative magnitude of the impact and long run effects. This path can be either smooth or oscillatory, implying in the latter case an alternating increase and decrease of the domestic price level in the short run. Three alternatives can be distinguished, which were shown in Figure 5 and are restated here. The first case is a high short run increase in the domestic price level, implying an overshooting of its long run level; the second case is a short run smooth increase of the domestic price level towards its long run level; and the last case allows for a short run decrease in the domestic price level.

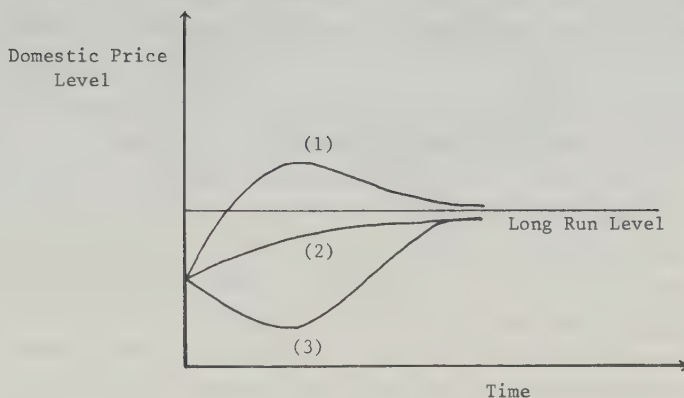


FIGURE 5

The time paths of adjustment of the domestic price level to devaluation

In lieu of a conclusion to this section, it is interesting to compare the income approach and the monetary approach for the effect of devaluation on the domestic price level. In the first approach devaluation will raise the domestic level, provided that the elasticities of supply are not infinite, but its increase is mitigated by an increase in real output if domestic resources are underemployed; the increase in real income, conditioned by the improvement in the balance of trade, induces an increase in expenditure and, hence, a secondary increase in prices. By neglecting the role of money, the income approach does not tell the whole of the story, and in particular, it does not provide for a short run price decrease of domestic goods. Moreover, domestic prices could permanently increase as long as a permanent improvement in the balance of payments is allowed:

The focus on monetary factors in the monetary approach permits a short run decrease in the price level of domestic goods. Under this view, the improvement in the balance of payments is seen as a redistribution in the world money stock and it is temporary. Consequently, the increase in the

domestic price level cannot last forever and comes to an end when equilibrium in the distribution of the world money stock is attained.

III.3. Devaluation and trade controls

As we have mentioned earlier, the existence of trade controls calls for some modifications of the analysis of devaluation. This is especially important for LDCs which are encumbered with several measures to control foreign trade. When these countries undertake a depreciation of their exchange rate, the question of an effective devaluation comes into play. The effectiveness of devaluation, in the case of LDCs, can be judged by two criteria, which are its ability to restore balance of payments equilibrium and its effect on the reallocation of resources. The impact effect of devaluation on the balance of payments works through the real balance effect and, hence, depends on the induced increase in the general price level. For a small country, which is a price taker for its traded goods, the real balance effect may be negligible. This is the case if the rate of devaluation is equal to the rate of tariff imposition or its equivalent (in the case of a complete removal of trade barriers after devaluation) and if the share of traded goods in domestic expenditures is small. Moreover, a devaluation accompanied by complete trade liberalization can entail a balance of payments deficit if imports increase afterwards. In this case, the government must take steps to reduce expenditures, the resources must be reallocated to increase exports or import substitution.

From the allocational standpoint, if the prevailing system is not one of floating exchange rates, the choice of the correct exchange rate is of utmost importance. This "equilibrium exchange rate" would be, under ideal circumstances, the exchange rate which would clear the foreign exchange market under conditions of free trade and full convertibility. In spite of the fact that the trade controls can be justified on the grounds of optimum tariff and of equilibrating expenditure with income

within a chosen equilibrium path, as we have insisted upon in the second chapter, the free trade equilibrium rate of exchange is a very useful indicative measure for evaluating "optimal" resources allocation. The equilibrium exchange rate, which is used as the shadow exchange rate in project evaluating analysis, constitutes thus an estimable point of reference for the choice of the appropriate rate of devaluation.

III.3.1. The concept of shadow exchange rate

It is hazardous to define "one" equilibrium exchange rate, for the exchange rate which keeps the balance of payments in equilibrium will depend, among other things, on the existing trade policies and domestic financial (fiscal and monetary) policies that prevail in the country. In the literature on this subject, two main proposals emerge. The first one, the purchasing-power-parity doctrine, in its absolute version, asserts that the equilibrium exchange rate between two currencies will be determined by the ratio of the prices of consumer goods of the two countries in question. The other proposal is derived from the partial equilibrium analysis and is often found in the discussions on the effective protection and its allocative effects¹⁾; by considering only the balance of payments, it purports to discover an exchange rate which will keep the balance of payments in equilibrium when all trade barriers are removed.

1) See : Edmar Bacha and Lance Taylor : "Foreign Exchange Shadow Prices : A Critical Review of Current Theories", Quarterly Journal of Economics, Vol. 85, May 1971, p. 197-224; B. Balassa and associates : The Structure of Protection in Developing Countries (The Johns Hopkins Press, 1971), in particular, Appendix A, p. 315-339; W.M. Corden : The Theory of Protection (Oxford University Press, 1971), in particular , chapter 5.

In fact, under free trade and full convertibility, goods arbitrage for each commodity will establish the appropriate relationship between the commodity's foreign price and domestic price and the exchange rate as follows : $P_{id} = P_{iw} R'$, where P_{id} and P_{iw} are respectively the domestic and foreign price of commodity i and R' the equilibrium exchange rate. The purchasing-power-parity doctrine puts forward a similar relationship which, however involves the general price level : $P_d = P_w R'$. This can be reformulated¹⁾ by taking account of import goods, export goods and non-traded goods with their respective shares in total expenditure : $R' = (P_{dx}/P_{wx})^\alpha (P_{dm}/P_{wm})^\gamma (P_{dh}/P_{wh})^{1-\alpha-\gamma}$ where subscripts x, m, h refer respectively to export, import and non-traded goods; α and γ are respectively the (domestic) expenditure weights of export and import goods. Assuming further that the differences between foreign and domestic prices are also due to foreign and domestic tariffs (t_x and t_m) imposed on traded goods and to a factor g for the case of non-traded goods, the relationships between individual prices of each commodity can be set as follows : $P_{dx} = P_{wx} t_x R$, $P_{dm} = P_{wm} t_m R$, $P_{dh} = P_{wh} g R$, where R is the actual exchange rate. After proper substitution, the purchasing power parity is seen as : $R' = R t_x^{-\alpha} t_m^\gamma g^{1-\alpha-\gamma}$.

Balassa²⁾ has demonstrated that g corresponds to differences in productivity and is roughly proportional to per capita income. Thus the purchasing power parity is seen as a weighted average of tariffs and subsidies and per capita income. The purchasing power parity cannot be the equilibrium exchange rate because the prices of non-traded goods are included in the computation of the general price level and are not equalized through trade; further, as stated above, it is only a tautological formula, devoid of any allocative implications.

1) This statement is made by Bacha and Taylor, op. cit.

2) B. Balassa : "The Purchasing Power Parity Doctrine : A Reappraisal", Journal of Political Economy, Vol. 72, December 1964, p. 584-596.

The problem of reallocation of resources implies a removal of tariffs and other trade barriers and an adjustment of the exchange rate to keep the balance of payments in equilibrium. Suppose that the balance of payments is kept in equilibrium by the imposition of tariffs on imports. This will raise the domestic price of imports and will induce a switch of production from export and non-traded goods towards import goods and will induce a substitution of consumption of import goods for export and non-traded goods. The elimination of tariffs will reallocate resources by taking away the relative advantage of the import goods; but to restore the balance of payments equilibrium, the exchange rate must be appropriately adjusted. This is obviously a partial equilibrium analysis, because it implicitly assumes that fiscal and monetary policies are so managed that internal balance is always maintained and that the price of non-traded goods is kept constant. Assuming further that the cross elasticities of import and export goods both in production and consumption are nil and that income effects of tariffs and exchange rate alterations are ignored, we can derive a formula of the equilibrium exchange rate interpreted in this sense. The last formula on page 128 has been worked out by Balassa¹⁾.

It must be first restated that under free trade and full convertibility, the domestic and foreign price of a commodity i are related by the equilibrium exchange rate : $P'_{di} = R' P_{wi}$. With the imposition of tariffs T on import goods and subsidies S (with negative sign) on export goods, the relationship between foreign and domestic prices becomes :

$P_{dx} = (1 + S) R P_{wx}$ and $P_{dm} = (L + T) R P_{wm}$, where R is the actual exchange rate which, in conjunction with tariffs and subsidies, keeps the balance of payments in equilibrium. Thus with the balance of payments in equilibrium and the trade barriers removed, the domestic prices must be :

1) Balassa : The Structure of Protection in Developing countries, op.cit.

$$\frac{P'_{dx}}{P_{dx}} - 1 = \frac{R'}{R(1+S)} - 1 \quad \text{and} \quad \frac{P'_{dm}}{P_{dm}} - 1 = \frac{R'}{R(1+T)} - 1$$

The increase or decrease in imports following their price change depends on the elasticity of import demand (η_m) and on the actual value of imports, under the assumption of infinite foreign elasticity of import supply :

$$dM = -\eta_m \left[\frac{R'}{R(1+T)} - 1 \right] M$$

The increase or decrease in exports following their price change will depend on the elasticity of supply of foreign exchanges and on the value of exports :

$$dX = \epsilon_f \left[\frac{R'}{R(1+S)} - 1 \right] X$$

ϵ_f can, in turn, be defined in terms of elasticities of demand for (η_x) and supply of (ϵ_x) exports : $\epsilon_f = \epsilon_x(\eta_x - 1)/(\epsilon_x + \eta_x)$.

Keeping the balance of payments in equilibrium gives : $dX - dM = 0$ or

$$\epsilon_f \left[\frac{R'}{R(1+S)} - 1 \right] X + \eta_m \left[\frac{R'}{R(1+T)} - 1 \right] M = 0$$

After proper substitution we obtain the following formula for the ratio of the equilibrium and actual exchange rates :

$$\frac{R'}{R} = \frac{\epsilon_f X + \eta_m M}{\frac{\epsilon_f X}{1+S} + \frac{\eta_m M}{1+T}}$$

S and T can here be taken as an average of the rates of subsidy and tariff, weighted by the shares of the different commodities in total exports and imports.

Thus R' would be an indicative value of the appropriate exchange rate (in the sense that it would keep the balance of payments in equilibrium) and the policy maker could approximately determine the rate of devaluation based on it. However it must be cautioned again that R' is not an exact reference value for an "equilibrium" exchange rate insofar as its determination does not take into account the effects of other economic policies, neither does it take account of the cross elasticities of import and export goods and the income effects of tariffs and exchange rate alterations.

III.3.2. Trade controls and the effect of devaluation on the price level

In this section, we shall discuss the possibility of a fall in the general price level after devaluation and the removal of trade restrictions. There are a short run and a long run view of the problem, each of them based on specific assumptions. The first version contends that if import restrictions are removed, the volume of imports can be increased, which will lower the domestic retail price of imports and hence, the general price level. This line of argument relies on several implicit assumptions which work separately or in concert : expenditures on imports must constitute the overwhelming part of total expenditures ; the domestic price of exports and of non-traded goods must remain constant (or fall); and in addition, a fall in the retail price of imports implies a curtailment or eventually a complete elimination of the monopoly profit that importers may enjoy in a regime of import restrictions (especially with a system of import licenses). In the case where the devaluation rate is equal to the tariff rate or its equivalent and where the domestic price of imports faithfully reflects the degree of import

restrictions, devaluation with removal of these restrictions does not necessarily entail a price decrease in imports. Moreover, if export prices are fixed in world markets, devaluation will raise the domestic price of exports. Even if the domestic economy can determine its export prices, a successful devaluation will induce an increase in the volume of exports and hence, an increase in their prices. This is true if the domestic elasticity of export supply is less than infinity. It is also true that the price of domestic goods can decrease in the short run, as is shown in figure 5. It remains, nevertheless, as is emphasized in the monetary approach, that a necessary condition for an improvement in the balance of payments is a rise in the general price level.

There is another argument for a fall in the domestic price level which, in our view, constitutes a long run analysis and which hinges on a successful reallocation of resources. The proponent is Sohmen¹⁾ and his argument can be summarized as follows. Suppose that before devaluation, the balance of payments is maintained in equilibrium by trade restrictions, and suppose also that the balance of payments is kept in equilibrium after devaluation. It is also assumed that some "neutral" monetary and fiscal policy maintains national income constant :

$$\sum P_1 Q_1 = \sum P_2 Q_2 \quad (1)$$

where P is the price level and Q is the real amount of absorption (or output), and subscripts 1 and 2 refer respectively to the pre- and post-devaluation situations.

The removal of trade restrictions will induce a reallocation of production along an optimal path, which, in turn, will increase the volume of real output. An increase in real output implies the following two inequalities :

$$\sum P_2 Q_2 \geq \sum P_2 Q_1 \quad \text{and} \quad \sum P_1 Q_2 > \sum P_1 Q_1 \quad (2)$$

1) E. Sohmen : Flexible Exchange Rates, op. cit., chapter 5

The first and second relationships together yield the final results :

$$\Sigma P_2 Q_1 / \Sigma P_1 Q_1 \leq 1 \quad \text{and} \quad \Sigma P_2 Q_2 / \Sigma P_1 Q_2 < 1 \quad (3)$$

It follows therefore that the price level unambiguously decrease. However, as Sohmen has already pointed out, if the balance of payments is improved, this conclusion does not hold and the price level will consequently increase.

This is a long run analysis because successful reallocation of resources, which will increase output, necessarily takes time; thus it is quite plausible that in the short run prices will increase as a result of devaluation. In addition, if the purpose of devaluation is to improve the balance of payments, absorption must be reduced, especially in a situation of full employment (as Sohmen has assumed in his analysis), and the increase in the price level is the major part of the adjustment mechanism.

Finally, it must be mentioned that in a study of devaluation in LDCs, Cooper¹⁾ has found that domestic prices of imports substantially increased after devaluation and then fell subsequently, but their final level was, however, higher than their pre-devaluation level. The bumpy shape of the time path of import prices can be attributed to the expectations effect noted earlier. Thus, in general, there is little possibility that the prices of imports and, a fortiori, the general price level fall after a devaluation. This price rise can be further strengthened by the upward adjustment of money wages.

1) R.N. Cooper : "An Analysis of Currency Devaluation in Developing Countries", op. cit.

CHAPTER IV

THE CASE OF THE PHILIPPINES

GENERAL SOCIAL AND ECONOMIC SURVEY

So far the problems of inflation and devaluation have been treated on a theoretical and very general level. In the two last chapters we shall switch from the general to the particular case, from the theoretical to the empirical ground. We shall investigate the economic structure and the economic policies of the Philippines and a reduced form of our monetary model with expectations will be tested against the Philippine data.

IV.1. Historical and social survey of the Philippines

IV.1.1. Historical background

The Philippines consist of 7'000 islands, of which about 800 are inhabited. Twenty-six major islands constitute 96% of the area and account for 97% of the population. The two principal islands of Luzon and Mindanao have about the two thirds of the total area and population. The population, at present, is approaching 39 Million inhabitants.

The recent history of the Philippines can be divided into three main periods : the Spanish colonization (1565-1898), the American colonization

(1898-1946) and the present period following the Philippine independence in 1946. Each of these periods has left important specific consequences on the domestic and social organizations of the country. The Spanish period installed a class of landlords or agricultural aristocracy, who shared political power with the clergy. The transfer of political control to the Americans reinforced the influence of the cacique class (or agricultural aristocracy), particularly when free trade between the US and the Philippines entailed the emergence of strong interest groups represented by the producers of primary exports. Sugar and coconut constitute the major export products and, not surprisingly, the sugar interest group is the most influential lobby in political life. The coconut interest group is less powerful because of its scattered structure, but, as its interests mingle with those of the sugar group, it has benefited from the strong backing of the latter. The American period thus witnessed a strong economic growth induced by exports of agricultural products. The increase of income fostered a parallel expansion of an incipient industry.

After independence, the adoption of highly protective measures permitted the emergence of a thriving industrial sector. The interests of this new industrial class rest upon the maintenance of the protective shield and the ensuing overvaluation of the domestic currency. The conflict of interests between this new class and the class of primary exporters is therefore inevitable, since a more realistic exchange rate would favour exports and, naturally, the traditional agricultural interest group.

IV.1.2. The modern political organization

The American model has strongly influenced the modern political organization of the Philippines. There are two political parties, the "nationalists" and the liberals, which are highly centralized and dominated by officials. Their political programs do not differ greatly

from each other, and politicians frequently switch from one party to another for electoral convenience.

The Philippine Constitution is based on the American Constitution and rests upon the separation of the three powers, executive, legislative and judiciary. The Presidency is the major holder of the executive power. Within the highly centralized Philippine political structure, the local governments are left with minor powers. In fiscal policy, for example, the bulk of taxes are levied by the national government and, consequently, the bulk of expenditures are spent by the national government. The local governments levy minor taxes, largely in the form of real estate, sales and amusement taxes.

The President can "legislate" through executive and administrative orders. Moreover, in addition to his powers over fiscal and budgetary policies, the President can extend his control over other economic policies, such as tariff and monetary policies. He can thus to a large extent determine the tariff rate and his influence spreads over to the decisions of the Central Bank and other governmental financial institutions. In fact, because the representatives of government institutions (the Secretary of Finance, the heads of the Development Bank of the Philippines and the Philippine National Bank) are members of the Monetary Board of the Central Bank, monetary policy is largely under the presidential control.

The Congress, which holds the legislative power, consists of the House of Representatives, whose members are elected for a fixed term of four years simultaneous with the President's term, and the Senate, which changes one third of its members every two years. In principle, the Congress is independent of the Presidency, but the predisposition for controversy of its members greatly contributes to its ineptness and it turns out that the Congress is not an important decision making body.

Finally, the Courts constitute an independent power, in charge of the interpretation of laws and constitutional provisions.

IV.1.3. Social Structure

As a colonial legacy, the Philippine nation is based on the political unification of diverse ethnic and regional groups. The Philippines remain an essentially agricultural nation. With a share of 34% of the net domestic product in 1969 (against 17% for manufacturing), the agricultural sector constitutes the dominant component of domestic production. The share of the agricultural sector in the total employed labor force is around 60%. Philippine peasantry is the largest class by its number, but the least powerful by its political influence. Rapid growth, relative immobility, and extensive poverty are among the most striking characters of this class which is, moreover, widely separated from other elements of the Philippine society. This difference is reflected in the large inequality between incomes in the urban and rural areas.

At the apex of traditional society and economic classes are the great landlords whose strength goes back to the Spanish period. Under their pressure, many programs of land reform are either aborted or are implemented at a strikingly slow pace. In recent periods a new influential class, represented by the industrialists, vies with the traditional agricultural aristocracy for power. But this does not mean that the delimitation between these two classes is clear, insofar as many landlords, particularly in the primary export sector, have successfully diversified into industry. It remains, nevertheless, that the respective interests of each of these two classes do not converge. The industrial group takes advantage of the protection of the domestic market and the ensuing overvaluation of the peso, while a devalued and more realistic exchange rate would serve the interests of the agricultural group.

The middle class, which mainly consists of the urban workers and employers cannot claim an influential position.

Finally, the foreigners constitute an important element in the social and economic life of the Philippines. The presence of foreign enterprises is widespread and their reported profits are generally higher than those of nationally owned firms. The largest corporations in the Philippines are often foreign firms, principally American, Chinese, Japanese, British, Spanish and Swiss. Their combined sales in 1969 were 4,068 Billion pesos, which is equivalent to over 13% of the total Gross National Product. The 150 largest corporations have an average rate of profit of 35%, while the average for foreign firms is 15% and for domestic firms 7.5% . 75% of the realized profits of foreign firms are repatriated. The Philippine Board of Investment has estimated that the share of foreign capital in the overall investments was 28% in 1968, and about 58% in 1975; this magnitude indicates the high dependence of the Philippine economy on foreign capital. The foreign firms concentrate mainly in the sectors of gasoline and related products, minerals, soap and detergents, copra, tobacco, sugar (refinery), and recently in banking. The penetration of foreign capital reinforces the power of the industrial group due to merged interests and also favours the appearance of a new technocratic class linked to foreign enterprises. Among the foreigners, two groups are worth mentioning. The first group is the Chinese which is the largest in number. The Chinese economic interest lies in the sector of retail trade, but recently the government has adopted several measures towards the Filipinization of this sector.

The second group of foreigners having a not negligible weight in the Philippine economic life are the Americans. Special statutes apply to the Americans, putting them on the same footing as the Philippine nationals. Thus, just after independence in 1946, a constitutional amendment gave to Americans all rights reserved for Philippine nationals with respect to investments in natural resource exploitation. This

provision for "parity rights" was later extended by the 1955 amendment to the original Philippine Trade Agreement of 1946 to all forms of American investments. The original Philippine Trade Agreement of 1946 also provided for other arrangements : a transition period for a preferential trade between the US and the Philippines was determined; quotas were fixed for Philippine exports to the US market; the Philippine government has no right to change the peso's parity and to impose export taxes without the agreement of the US President. In 1955 the Trade Agreement was revised and the last provision, which impinged on Philippine sovereignty, was eliminated. The Agreement expired in July 1974 and the preferential basis of mutual trade and the "parity rights" also disappeared at that time.

In view of the social structure just described, it is not surprising that the income distribution of the Philippines is among the most unequal in the world. This can be seen from the following table, which is reproduced from the work of A.K. Sen¹⁾

Table 4

Philippines : comparative income distribution in selected countries

Country and year	Share of ordinal groups				
	Bottom 20%	Bottom 60%	Top 20%	Top 10%	Top 5%
Philippines 1956-57	4.5	25.0	55.0	39.4	27.7
Philippines 1961	4.2	24.2	56.4	41.0	29.0
Philippines 1965	3.5	24.3	55.4	40.0	28.7
India 1953-57	8.0	36.0	42.0	28.0	20.0
Ceylon 1952-53	5.1	27.7	53.9	40.6	31.0
Barbados 1951-52	3.6	27.1	51.6	34.2	22.3
Puerto Rico 1953	5.6	30.3	50.8	32.9	23.4
United Kingdom 1951-52	5.4	33.3	44.5	30.2	20.9
United States 1950	4.8	32.0	45.7	30.3	20.4

Source : A.K.Sen p.101, Table 19.

1) A.K. Sen : "The Philippines", Economics Bulletin for Asia and the Far East, United Nations, December 1971.

It appears that the top 5% of income earners receive more than the bottom 60%. It also appears that the pattern of income distribution in the Philippines remained almost static during the decade 1956-65 covered by the study, with, however, a slight decrease of the income share of the bottom 20% and a slight increase of the share of the top 5% in 1965.

The disparity in income earnings appears more clearly when the urban area is compared with the rural area. Table 5, which is also reproduced from the study of Sen, clearly shows this disparity :

Table 5

Philippines : Percentage distribution of families and of total family income by income class : aggregate, urban and rural, 1965

Pesos	Aggregate		Urban areas		Rural areas	
	Families	Income	Families	Income	Families	Income
Under 500	11.6	1.4	4.5	0.3	14.5	2.6
500 to 999	17.7	5.3	7.7	1.3	21.9	9.4
1,000 to 1,499	16.7	8.1	11.7	3.3	18.8	13.2
1,500 to 1,999	13.5	9.2	11.4	4.5	14.4	14.1
2,000 to 2,499	9.9	8.8	12.1	6.2	9.0	11.5
2,500 to 2,999	7.6	8.1	9.5	5.8	6.8	10.5
3,000 to 3,999	8.9	12.1	13.0	10.2	7.2	14.1
4,000 to 4,999	4.6	8.0	7.0	7.1	3.5	8.9
5,000 to 5,999	2.8	6.0	5.6	6.9	1.6	5.1
6,000 to 7,999	2.5	6.8	5.3	8.3	1.3	5.2
8,000 to 9,999	1.5	5.4	4.3	8.7	0.4	2.0
10,000 and over	2.6	20.8	7.9	37.3	0.4	3.4

Source : A.K. Sen, p. 101, Table 21

It is also found, for the year 1965, that the average annual income for rural families was 1,755 pesos, while that for urban families was 4,405 pesos. This means that the average income of urban families was

about 2.5 times the rural average income.

There are also substantial regional disparities, with the average income of metropolitan Manila being the highest, followed by the average income of the region of Luzon.

This inequality in income structure requires the implementation of a public policy to redistribute income. We shall see later that the fiscal system itself is highly regressive and that public expenditures represent a small amount in total expenditures of the Philippine economy. This suggests that efforts on the fiscal side and a reform of the pattern of taxation are necessary, and more social programs must be launched.

IV.2. Structure of the Philippine economy

IV.2.1. General economic survey

The first indicator of a country's economic growth is the rate of growth of its GNP at constant prices. Table 6 reproduces the real rate of growth of the Philippines during the period 1951-72.

Table 6

Philippines : Main economic indicators

Percentage rate of growth of GNP at constant prices

<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
4.7	8.7	7.8	5.4	7.8	5.1	4.4	4.2	5.9	2.6	6.5	6.1
<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
7.4	2.5	5.5	6.0	6.2	6.4	6.7	5.0	6.5	4.3	9.4	5.2

Percentage rate of growth of Agricultural production

<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1960-65</u>	<u>1965-67</u>	<u>1968</u>
5.4	1.0	2.0	7.9	1.8	3.6	0.9	4.3	4.1	6.5	8.2
<u>1969</u>	<u>1970</u>	<u>1971</u>								
8.2	6.0	5.3								

Percentage rate of growth of Industrial production

<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1960-65</u>
17.3	5.3	13.0	12.4	12.6	15.7	8.0	7.7	8.3	2.9	4.0
<u>1965-67</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>						
6.8	6.4	5.7	6.5	3.7						

Source : Data compiled from : Economic Survey of Asia and the Far East (United Nations), Statistical Bulletin of the Central Bank of the Philippines

It appears that, except for the two years 1960 and 1964, where it reaches the level of 2.5, the Philippine rate of growth is somewhat satisfactory. The average rate for the period 1965-71 is about 6%, which compares well with the world average for the 1960s of 5.0% and an

average for LDCs of 5.5%. However, with an estimated rate of growth of the population of 3.5% during the 1960s, the per capita income shows a weaker performance. If we add to this picture an officially estimated average rate of unemployment of 6% (which is highly understated¹⁾ in view of the large underemployment in all sectors, particularly in the rural sector), the Philippine economy looks less buoyant.

It is also interesting to investigate the sectoral rates of growth, which will inform us on the evolution of the structure of the economy. The two main sectors, Agriculture and Industry, do not follow the same path of expansion and this divergence is already indicative of the Philippine economic choices. Looking at the recorded rates of growth in the agricultural sector for the period 1953-71, we can roughly distinguish two sub-periods : the first stretching over the years 1953-65, the second over 1965-71. With the exception of the year 1956, the average rate of growth in the first period is lower than the average rate of growth in the second period. It is evident that many factors contribute to the development of the agricultural sector; such factors as natural weather conditions, world demand for agricultural products, land reform and expansion of agricultural credit are not negligible. In addition, economic policies also determine the orientation of the national production. Thus it is interesting to note that, prior to 1962, a system of high protection of domestic manufacturing prevailed. The national currency was concomitantly overvalued, penalizing thus the primary exports. Moreover, the agricultural sector was neglected during this period to the benefit of the industrial sector, and a few investments were made to improve the agricultural infrastructure. After the devaluation of 1962 which raised the prices of the imports of foodstuffs

1) Le Monde Diplomatique, November 1972, in a survey of the Philippines, has produced a number of 30% for the "real" rate of unemployment and underemployment.

(and which gave an impetus to primary exports), the government changed its policy towards agriculture and more attention was devoted to an improvement in agricultural production, particularly in the production of foodstuffs. In the mid-1960s for instance, high yielding seed types were introduced.

The industrial sector exhibits the same division in time. The first time span 1951-59 witnessed a rapid progress of the industrial sector. This is obviously due to the policy of the government, encouraging industrialization by highly protective measures. However, insofar as this industrialization was inwardly oriented, the limits of the domestic market imposed a slowing down of the pace of development of this sector. From 1960 on, the industrial rate of growth hovered around 6%, with a noticeable worsening in 1971.

Focusing now our attention on the structure of the Philippine national production, we first notice that it is characterized by a remarkable stability since 1950, both in the distribution of the shares of Net Domestic Product and in the distribution of the shares of employment between different sectors. In Table 7, we see that Agriculture accounts for about one third of NDP and Industry for one fifth of NDP. In spite of industrialization, the Philippines remain mainly an agricultural economy. More interesting is the respective shares of Agriculture and

Table 7

Industrial structure

Year	1902	1918	1950	1954-56	1959-61	1964-66	1969	1973
% share of Agric. in NDP	55	60	36.4	34.6	31.7	30.1	34.1	31.5
% share of Ind. in NDP	13	12	13.2	26.5	27.8	27.7	19.6	20.0
% share of other sectors in NDP	32	28	50.4	38.9	40.5	42.2	46.3	48.5
% share of Agric. in tot. employ.	78	82	61.7	...	61.2	57.6	...	...
% share of Ind. in tot. employ.	5	6	...	...	17.9	18.7		
% share of other sect. in tot. empl.	17	12	...	...	20.9	23.7		

Source : the same as for Table 6

Industry in total employment. Before 1950, i.e. before the government has taken steps to foster industrialization through protective measures, the share of Agriculture in total employment was very high, amounting to 80%, while the share of Industry was extremely low with 5% or 6%. With postwar industrialization, the share of Agriculture was cut down to about 60% and it remains on this level until recent periods. The figures from Table 7 also suggest that the industrialization is unable to absorb labour from the agricultural sector, for while the share of Industry in NDP grows from 13.2% in 1950 to about 20% in recent periods, the share of Agriculture in total employment remains roughly the same, stabilizing around 60%. As will be seen later, this is due to the bias towards capital-intensive production process of the Philippine industry.

Turning to the organization of the agricultural area, we can distinguish between two principal sectors. The first sector produces food crops as rice and corn for the subsistence needs of the cultivator and for the supply of the domestic market; it is generally organized into small units and is characterized by wide-spread tenancy. The second sector is specialized in primary production for exports, among which coconut and sugar are dominant. Coconut is a scattered, small-holder production, while sugar is a more organized production. But still in this agricultural export sector, mechanization is limited and landless labor is in charge of cultivation. The great problem in agriculture lies in the structure of Philippine land ownership and calls for a vast land reform program. Thus A.K. Sen¹⁾ estimated that the arguments for land reform arise not only from considerations of equity, but also from those of efficiency, since unfavourable tenancy arrangements and exploiting landlordism interfere with the economic allocation of resources.

Industrialization in the Philippines was first initiated within the importsubstitution programs of the 1950s and its structure has remained for the great part unchanged ever since. Import substitution has taken the form of assembling or concentrating on the relatively later stages of production. An examination of Tables 8 and 9 gives an insight into the Philippine industrial structure.

1) A.K. Sen, op. cit. p. 106

Table 8

Distribution of value added in Philippine Manufacturing by industrial groups (%)

Industry	1902	1918	1938	1948	1956	1967
Food manufacturing	25.7	50.9	52.1	30.8	27.0	25.8
Beverages	12.7	5.3	4.7	25.1	10.7	8.7
Tobacco products	24.2	9.6	7.2	4.7	6.1	4.6
Textile products	0.5	0.5	0.8	2.6	3.7	4.5
Footwear & wearing apparel	5.9	3.5	7.8	6.6	5.1	7.0
Wood & cork products	8.0	5.4	5.3	9.7	5.0	4.6
Furniture & fixtures	2.3	1.3	1.9	1.8	1.3	1.6
Paper & paper products	0.0	0.0	0.0	0.0	1.7	2.2
Printing & printed products	4.9	1.7	3.6	3.7	3.1	3.4
Leather products	0.7	0.3	0.1	0.0	0.2	0.3
Rubber products	0.0	0.0	0.0	0.6	0.9	3.3
Chemicals & chemical products	1.9	10.9	6.9	2.9	9.9	10.1
Products of coal & petroleum	...	...	...	...	...	...
Nonmetallic mineral products	3.9	0.7	3.3	2.1	4.7	4.3
Basic metal & metallic products	0.9	0.8	0.7	1.9	4.7	6.9
Machinery	3.6	0.8	0.2	0.5	2.1	4.8
Transportation equipment	...	1.3	0.4	1.0	2.2	3.0
Miscellaneous manufactures	4.2	5.9	3.9	5.7	11.2	4.9
Unallocated	0.6	1.1	1.1	0.4	0.4	0.0
Total manufacturing	100.0	100.0	100.0	100.0	100.0	100.0

Source : J.H. Power : "The Structure of protection in the Philippines",
in Bela Balassa and associates : The Structure of Protection
in Developing Countries (The Johns Hopkins Press, 1971)
p. 265, Table 11.3

The bulk of the industrial production is devoted to consumer goods, while 80% of the capital equipment and machinery are imported. The high dependence of the Philippines on the importation of capital goods is an element of the vulnerability of the economy in general, and of the external position in particular. Moreover, the slackening of the industrial

Table 9

Philippine Manufacturing Production and Imports, 1948-65

Product category	1948		1956		1960		1965	
	Mil. Pesos	%	Mil. Pesos	%	Mil. Pesos	%	Mil. Pesos	%
Intermediate goods								
Production	28.3	3	147.3	8	507.9	15	1318.9	21
Imports	263.8	36	317.5	46	348.4	42	751.2	39
Production/total supply		10		32		59		64
Inputs in construction								
Production	35.9	4	117.4	7	230.7	7	395.8	6
Imports	91.4	13	92.6	13	66.4	8	173.3	9
Production/total supply		28		56		78		70
Capital goods								
Production	10.9	1	61.8	3	89.9	3	218.2	4
Imports	92.8	13	178.3	26	340.1	41	866.7	45
Production/total supply		11		26		21		20
Consumption goods								
Production	612.9	65	953.4	52	1698.3	52	2748.7	43
Imports	274.3	38	105.6	15	74.7	9	134.8	7
Production/total supply		69		90		96		95
Export goods								
Production	167.3	18	242.6	13	285.2	9	952.7	15
Rice mill products								
Production	11.1	1	11.1	1	21.5	1	28.1	...
Sugar mill products								
Production	78.4	8	285.1	16	411.1	13	684.1	11
Total								
Production	944.8	100	11818.7	100	3244.3	100	6346.5	100
Imports	722.3	100	694.0	100	829.6	100	1926.0	100
Production/Total supply		57		72		80		77

Source : J.H. Power : "The Structure of Protection in the Philippines", in Bela Balassa and ass. : The Structure of Protection in Developing Countries (The Johns Hopkins Press, 1971) Table 11.3, p. 265

sector in recent periods may be easily explained by the saturation of the domestic market for consumer goods (domestically produced). Another characteristic of the Philippine industry is its widespread excess capacity. A lack of domestic demand is certainly responsible for the low rate of capacity utilization. However, when this phenomenon is persistent over time and when it is coupled with a high rate of unemployment and underemployment, its causes must also be found in the economic policies adopted by the government. One possible explanation is the abnormally low costs of capital, allowed by an overvaluation of the peso and a low ceiling rate of interest. In fact, in a study on industrial production functions in the Philippines, J.G. Williamson¹⁾ has used the CES function to estimate the elasticity of factor substitution in the Philippine industry; he has found that this elasticity of substitution exceeds unity. It means that the responsiveness of the Philippine industry to low costs of capital is very high and, at the end, there is a bias towards capital-intensive production processes.

Another problem which contributes to the fragility of the Philippine economy and of its external position is its increasing external debt. Thus, for the year 1969, the outstanding external debt amounted to 600 Million dollars, equivalent to over one half of the current account receipts of foreign exchanges. Of this amount 240 Million dollars represented short-term credit. The accruing debt servicing (interest payments and amortization) for the year 1970 amounted to 358 Million dollars.

IV.2.2. The pattern of foreign trade

The export performance of the Philippines can be assessed by considering total exports and their composition. The rate of growth of total exports can be taken as reasonable, reaching an approximative level of 7%, except for the first postwar period 1950-55 where it was rather low.

1) Jeffrey G. Williamson : "Relative Price Changes, Adjustment Dynamics and Productivity Growth : The Case of Philippine Manufacturing", Economic Development and Cultural Change, Vol. 19, July 1971, p. 507-526.

Table 10

Growth rates of exports and imports (%)

	<u>1950-55</u>	<u>1955-60</u>	<u>1960-67</u>	<u>1950-67</u>
Exports	3.9	5.9	6.6	5.9
Imports	9.9	2.0	8.5	6.9

Besides the evolution of world demand, the progress in the export sector depends to a large extent on economic policies and more specifically on foreign trade policies, which tend to promote or to discourage exports, and on the capacity of the country to diversify its exports in the future. In fact the broad composition of Philippine exports has remained by and large unchanged since the 1950s. The bulk of exports is agricultural and mineral products, whose share in total exports amounts nearly to 90%. The importance of the five principal exports (copra and its by-products, sugar, wood and logs, copper ores and concentrates, abaca) in the composition of exports is almost the same over time. The share of manufactured products improves at a very low pace, from 4.1% of total exports in 1960 to 8.5% in 1968. The following Table 11 gives us information on the structure of Philippine exports and its evolution.

Table 11

Principal exports of the Philippines, 1950-67 (% of total exports)

Commodity	1950	1955	1960	1965	1967
Copra	42.0	29.8	24.8	21.4	15.9
Desiccated coconut	7.4	3.2	3.4	2.6	2.1
Coconut oil	3.8	4.2	2.8	8.4	6.9
Copra cake & meal	1.2	1.1	0.9	1.5	1.3
Tropical logs	3.3	10.5	16.4	18.5	24.4
Sugar	14.0	26.7	23.9	18.0	15.2
Copper ores & concentrates	0.5	1.4	3.3	5.0	6.5
Abaca	12.7	7.0	7.5	3.1	1.7
Canned pineapple	2.9	1.5	1.3	1.5	1.4
Chromium ores & concentrates	0.7	2.6	3.1	1.5	1.1
Plywood & veneer	0.0	0.2	1.2	2.3	3.8
Total principal exports					
Including plywood & veneer	88.5	88.2	88.6	83.8	80.3
Excluding plywood & veneer	88.5	88.0	87.4	81.5	76.5

Source : J.H. Power : "The Structure of Protection in the Philippines",
op.cit., p.266, Table 11.4

It is also of some interest to know the position of the Philippines in the world production and export of its principal products. In 1960 the percentage share of the Philippines in the world production of copra and coconut oil was 42.0% and in 1965 it was 43.3%. The figures of Table 12 on the share of the Philippines in total world exports indicate, for the period 1963-66, an average percentage share of 61.9 for copra, 5.7 for sugar, and 94.5 for abaca. With a relatively high share for coconut and abaca, the Philippines have some degree of freedom in the price determination of these two categories of products. As for sugar, The Philippines enjoy a guaranteed sale with fixed quotas in the US market at a relatively high price; however, the Philippines did not make full use of these quotas, and the Sugar Quota Administration has estimated the unutilized quota to be of the order of 203 thousand tons.

Table 12

Share of Philippine exports in world exports (%)

	<u>1950-53</u>	<u>1963-66</u>
Copra	45.2	61.9
Sugar	4.9	5.7
Tropical logs	34.9	33.5
Coconut oil	21.1	50.9
Abaca	84.0	94.5

Source : Bela Balassa and associates : The Structure of Protection in Developing Countries, op. cit., p.331, Table A.2

Thus, a rapid expansion of sugar exports can be realized if an appropriate policy to promote these exports is applied.

On the other hand, the structure of imports faithfully reflects the government policies of protection and import substitution. In the 1950s a policy of import substitution, mainly of consumer goods, and of high protection of the domestic production was implemented. In the early 1960s, decontrol was applied, along with the devaluation of 1962, but the tariff structure continues to provide high protection for domestic consumer goods. In consequence, as can be seen from Table 13, the importation of raw materials, processed and unprocessed, and of machinery and equipment substantially increased after 1950, while imports of consumer goods were cut down. The weakness of Philippine industrialization program is characterized by its strong reliance on imported producer goods and some authors, like Power and Sicat¹⁾, have recommended a switch towards backward linkages of manufactures. In addition, the tariff

1) Power and Sicat, op.cit.

Table 13

Percentage distribution of imports, 1949-68

	1949	1951-3	1955-7	1959-61	1963-5	1967-9
Producer goods	62.7	76.8	81.7	86.1	83.9	87.9
Machinery & equipment	9.9	9.1	11.0	19.7	17.4	19.9
Unprocessed raw materials	1.0	1.6	4.2	10.4	15.4	13.1
Semi-processed raw mater.	41.6	48.0	51.3	45.8	45.9	50.2
Supplies	10.1	18.0	15.2	10.2	5.1	4.5
Consumer goods	37.3	23.2	18.3	13.9	16.4	12.1
Durable goods	2.5	1.6	1.3	0.8	1.0	1.1
Non-durable goods	34.8	21.6	17.0	13.1	15.4	11.0

Sources : J.H. Power and G.P. Sicat : Industrialization and Trade Policies :
The Philippines (Oxford University Press, 1971), p. 39, Table 2.4

structure and the control measures (along with a policy of low rate of interest) induce a low cost of capital which, by enhancing capital-intensive production processes , is detrimental for the employment of the labor surplus.

IV.2.3. The money and capital markets

The Philippine credit market is well endowed with appropriate financial institutions, but by its size and depth it can in no way be compared with the credit system of developed countries. The period 1949-60 was one of expansion of the network of financial institutions, both public and private. Commercial banks provide the major part of domestic credit and their activities are growing rapidly. Thus total commercial banks' credit as a percentage of Gross Domestic Product rose from 12.58% in 1960 to 19.76% in 1969, Table 14 shows the distribution of these credits among different sectors. It can be seen that the share of Commerce (including

Table 14

Commercial banks' credit : distribution to various sectors (in Millions
of Pesos and in percentage)

	Total for all sectors		Agriculture		Mining&quarrying		Manufacturing	
	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>
Mil. P.	1,684.6	5,896.4	450.1	1,462.6	21.7	35.0	547.2	1,473.3
%	100.0	100.0	26.7	24.8	1.7	0.6	32.5	25.0
	Construction		Commerce (incl. foreign trade)		Public utilities		Personal consumption	
	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>	<u>1960</u>	<u>1969</u>
Mil. P.	20.2	112.6	407.1	1,858.3	41.4	167.1	60.8	207.4
%	1.2	1.9	24.2	31.5	2.5	2.8	3.6	3.5
Others								
	<u>1960</u>	<u>1969</u>						
Mil. P.	136.1	580.1						
%	8.1	9.8						

Source : Central Bank of the Philippines, Statistical Bulletin, Vol.XXI, No. 4, statistical appendix to the Twenty-first Annual Report, 1969, p. 67-72

foreign trade) increased. A great number of foreign banks are also established in the Philippines and they have a relative advantage over domestic banks in the financing of foreign trade.

It is noteworthy that agricultural credit is not neglected. The share of Agriculture in commercial banks' credit is roughly equal to the share of Manufacturing and amounts to one fourth of total commercial banks' outstanding credit in 1969. However, these credits do not probably reach the small peasant, (witness the persisting importance of

rural moneylenders), but they generally concern the primary export sector. Along with commercial banks, a great number of small rural banks, subsidized to a limited extent by government subscription of their capital and by rediscount privileges at the Central Bank, constitute another source of funds for the agricultural sector. The government-capitalized Agricultural Credit and Co-operative Financing Administration (ACCFA), whose funds are mainly advanced by the Central Bank, provides subsidized credit to the Farmers' Cooperative Marketing Association (FACOMAS). In spite of the existence of these financial institutions, the moneylender still constitutes an important source of finance for agricultural production and marketing. The moneylender is typically the landlord or the middleman who assembles the crops for transportation to domestic markets or abroad. He makes advances against crops at a high rate of interest.

The government financial institutions hold the lion's share of the credit market. The government-owned Philippine National Bank, which is a commercial bank, controls about one fourth of the total assets of the commercial banking system. The government long-term financial institutions (the Development Bank of the Philippines, the Government Service Insurance System, the Social Security System) generate more than 90% of the external long-term funds for industry. Finally, the already mentioned ACCFA bestows credit to the agricultural sector.

Gross domestic savings come to a large extent from the households sector. However, a great deal of these savings (from 1/2 to 3/4) go into non-financial tangible assets. The next source of saving is business enterprises with their ploughed-back profits. The typical Philippine firm is family-dominated, regardless of the legal form, and business capital is traditionally family wealth. Finally, the business enterprises can obtain long-term funds by the roll-over of short-term advances from the commercial banks.

IV.3. The apparatus of economic policies of the Philippines

IV.3.1. Economic institutions

An insight into the working of different economic institutions will give us a general idea on the effectiveness of the administrative economic organization and also on the lags between the implementation of an economic policy and its effect.

At the outset, we can say that the Presidency has a widespread control on all economic policies and the power of the Congress in this matter is weak. The first important policy-making body is the Cabinet, which is responsible for most of the short-run urgent policies and also for others; it is in close liaison with the Monetary Board of the Central Bank.

The Budget Commission is the second important executive agency, which is in charge of the fiscal planning of government receipts and expenditures. The Budget Commission has a broad power on allocation decisions and plays a liaison role between the Congress and the executive. In principle, the Congress is the originator of all laws concerning the use of public funds; however, because of its tendency to enact bills appropriating public money without defining specific fund sources, and to legislate more appropriations than could be met by budgetary resources, the Presidency, through the Budget Commission, has consequently wide discretion on the choice of priorities in the utilization of government funds.

The executive agency responsible for long-term economic planning is the National Economic Council (NEC). Its attribution is the preparation of economic plans, but, in fact, it is isolated from the rest of the government machinery for planning which makes its power in policy making rather weak. The NEC membership is a mixture of representatives from the two houses of the Congress and of appointees of the President.

In 1962 a technical economic staff directly under the Office of the President, the Program Implementation Agency (PIA), was set up. It was later reorganized into the Presidential Economic Staff (PES) in 1966. It has taken an active role in planning and in implementing the plans. Its effectiveness is increased by its close links with other operational agencies of the government.

The Monetary Board of the Central Bank, which conducts the monetary policy, consists of seven members, among whom are the Secretary of Finance, the heads of the Development Bank of the Philippines and of the Philippine National Bank, and, of course, the Governor of the Central Bank. The Central Bank of the Philippines was established in January 1949 and the Central Bank Act defines its responsibilities as follows : "(a) to maintain monetary stability in the Philippines; (b) to preserve the international value of the peso and the convertibility of the peso into other freely convertible currencies; and (c) to promote a rising level of production, employment and real income in the Philippines."¹⁾ The Central Bank Act also contains carefully written provisions on the management of the international reserves and the access of the government to the Central Bank to finance its budget deficit. When the international reserves of the Central Bank fall to an "inadequate" level, the Monetary Board must take remedial measures. "If the resultant actions fail to check the deterioration of the reserve position of the Central Bank, or if the deterioration cannot be checked except by chronic restrictions on exchange and trade transactions or by sacrifice of the domestic objective of a high level of production, employment and real income, the Monetary Board shall propose to the President such additional actions as it deems necessary to restore equilibrium in the international balance of payments of the Philippines".²⁾

1) Quoted by Frank H. Golay : The Philippines : Public Policy and National Economic Development (New York, Cornell University Press, 1961) p. 217.

2) *ibid.*

In principle, access of the government to the lending facilities of the Central Bank is limited. The Central Bank Act states that direct loans of the government and its agencies are limited to short-term advances for the purpose of covering seasonal gaps between revenues and expenditures. However, experience has shown that the government, by issuing government bonds, has a powerful instrument to get credit. Because of the narrowness of the market for government bonds, the issues tend to end up in the portfolio of the Central Bank.

The Central Bank is also responsible for the control of any expansion or contraction in the money supply, or of any rise or fall in prices. However, because of the inverse relationship between domestic credit and international reserves and of the issuance of government bonds, the Central Bank has lost much of its power over the control of the overall money supply.

IV.3.2. Fiscal system

It is a truism to say that the capacity of the government to decrease its budget deficit depends by and large on its capacity to increase the fiscal receipts. This principally means that the contraction or expansion of the government budget deficit depends more on the revenue side than on the expenditure side, because the public expenditures in the Philippines have always represented a small share of total national expenditures and could not be squeezed without jeopardizing the minimum social programs of the government. The small amount of public expenditures in the Philippines comes out more clearly in comparison with other LDCs of comparable economic size.

In a study on the response of the tax structure of the Philippines to

economic growth, Sicat¹⁾ has found the following results, reproduced in Table 15. These were obtained from a regression of taxes on GNP, using the data of the General Auditing Office and covering the period 1954-69 for income tax, excise tax and total tax revenue, the period 1955-69 for import duties and 1956-69 for licence and business tax. It appears that excise tax is completely independent of GNP. As for the other taxes, although there is a strong relationship with GNP, as is reflected in the high $\bar{R}^2$ and elasticities, the coefficients of their regressions on GNP are rather low. These results show the past incapacity of the government to raise tax revenues as the economy grows.

It is also of some interest to look into the structure of the Philippine

Table 15

Philippines : Taxes regressed on GNP

<u>Tax</u>	<u>Const. Term</u>	<u>Regr. Coef.</u>	<u>$\bar{R}^2$</u>	<u>Elast. at means</u>
Income tax	-69.50	.023 (21.71)	.969	1.247
License and business tax	-96.83	.25 (19.57)	.967	1.299
Excise tax	161.13	.002 (.78)	-.027	.129
Import duties	-52.42	.023 (11.93)	.910	1.167
Total tax revenue	-106.25	.077	.983	1.097

(The figures in parentheses are t values)

1) G.P. Sicat : "Aspects of Philippine tax and expenditures policy", Research paper No. 71-1, NEC, Office of the Chairman, July 1971, quoted by A.K. Sen, op. cit., p. 102-103.

fiscal system. In Table 16, which shows the percentage distribution of taxes, we can see that the share of income taxes in total tax revenues is still low, amounting to 30% in 1970/71; the share of indirect taxes is accordingly high, with import duties representing the highest proportion, specially after the introduction of the protection system.

Table 16

Percentage distribution of taxes

Year	Total tax revenue	Import duties	Transactions & consumption taxes	Licenses, stamp duties, regist. fees etc.	Tax on income and wealth	Other taxes
1950/51	100.00	5.87	38.15	33.86	22.12	0.00
1955/56	100.00	33.47	18.29	25.75	19.24	3.25
1960/61	100.00	29.25	17.55	23.22	25.02	4.95
1966/67	100.00	22.93	19.21	28.56	25.66	3.63
1970/71	100.00	26.94	10.80	28.89	29.93	3.44

Source : Economic Survey of Asia and the Far East, United Nations.

A deeper examination of the fiscal system brings out its regressive character. Agricultural income, which is mainly concentrated in the hands of the landowners, is difficult to assess and, hence, to tax. Moreover, a tax on land does not exist at all and real property taxes, as administered by local governments, are subject to statutory low rate limits, to low ratios of assessed to market values and to frequent tax remission. Finally, tax evasion is pervasive . A. K. Sen¹⁾ has estimated that 35% of total internal revenue collection is evaded.

1) A.K. Sen, op. cit..

Two recent fiscal measures are worth mentioning. The first is the introduction of an export tax, effective May 1, 1970. The tax rates were set up to decline until the imposition of export taxes would stop at the end of June 1974. The receipts were substantial (estimated to 443 Million Pesos in 1971), but the funds were specifically earmarked for certain purposes : 50% for debt servicing and stabilization, 25% for credit to exporters and 25% to be used as local counterpart funds for public investments. With the devaluation of 1970 and the subsequent floating of the pesos, it was expected that the export tax would not substantially affect the export incentives.

The second measure was a change in income taxes in 1969 on the eve of elections. The brackets were extended and this contributed to making the tax structure slightly more progressive. However, this measure was accompanied by several deductions which almost nullified its effect.

IV.3.3. Monetary instruments

Before discussing the monetary instruments for the Philippines, we shall give an extremely simplified description of the money creation process which will help us to understand the mechanism of monetary policy. In what follows, money is narrowly defined as the sum of demand deposits and currency (M_1).

Under a system of fractional reserve and fiat money, the outstanding stock of money is some multiple of the monetary base. The latter is the sum of the reserves of commercial banks and the stock of currency in circulation among the public. Denoting the stock of money by M , the monetary base by F , the ratio of reserves (G) to demand deposits (DD) by r , the ratio of currency (C) to the stock of money by c , we can write the following statements :

$$F = G + C$$

$$M = \frac{1}{r(1-c) + c} \cdot F$$

Consider now the role of the government in the determination of the monetary base. Any net cash inflow or outflow in the government's account will change the monetary base by the same amount :

$$\Delta F = \Delta G + \Delta C$$

$$\Delta F = E - T - \Delta B - \Delta B_{bg} + H$$

where E = government expenditures

T = government tax revenues

B = government borrowing outside the banking system

B_{bg} = government borrowing from the banks

H = residual, including balance of payments, foreign expenditures of the government, and change in net claims of the Central Bank on the rest of the banking system

Turning now to the banking system, the stock of demand deposits is backed by the stocks of reserves and of advances to the public and the government :

$$DD = G + B_{bg} + B_{bp}$$

where B_{bg} = government borrowing from the banks

B_{bp} = public borrowing from the banks

Now : $F = C + G$ or $G = F - C$

Then : $DD = F - C + B_{bg} + B_{bp}$

and : $M = DD + C = F + B_{bg} + B_{bp}$

Finally : $\Delta M = \Delta F + \Delta B_{bg} + \Delta B_{bp} = E - T - \Delta B + \Delta B_{bg} + H$

The final statement tells us that an increase in government expenditures, as well as an increase in the banks' advances to the public raises the money supply; the contrary is the case with taxes and with government borrowing outside the banking system. Roughly speaking, fiscal policy works through manipulation of the government budget deficit ($E - T$) ; monetary policy works through the managing of government borrowing outside the banking system by open market operations, through changes in reserve requirements and through changes in the discount rate (which is expected to influence the banks' advances). To these traditional tools of monetary policy can be sometimes added other non-traditional tools, such as moral suasion and gentlemen's agreement.

After this digression on the mechanisms of money creation, we shall now focus our attention on the monetary instruments at the disposal of the Central Bank to conduct its policy. With respect to the policy of maintaining international reserves at an adequate level, the Central Bank, although required in principle to buy any quantity of convertible foreign exchange offered and to sell any quantity demanded, is empowered to suspend or restrict sales. Filipino recipients of foreign exchange are required by law to surrender their receipts in exchange for pesos.

The traditional set of tools of monetary policy comprises manipulation of the Central Bank discount rate, open market operations, changes of reserve requirements of the banks and selective credit controls. In addition, the Central Bank has sometimes recourse to moral suasion. The first two instruments are the least effective. Several factors contribute to handicap the use of rediscount rates : small amounts of bank borrowing from the Central Bank, existence of large cash reserves in excess of legal requirements, existence of a non-monetary sector in the economy and existence of foreign banks, which can replenish their cash by borrowing either from their head offices or from money markets abroad. Moreover, it is the usual practice of the Philippine government to maintain the

rate of interest rather low to encourage investment. The reason why open market operations are difficult or impossible to realize is quite obvious : the public holdings of government bonds are very small. Experience has also shown that commercial banks tend to liquidate their holdings of government securities after one or two years, with the consequence that these securities accrue for most part to the Central Bank.

The next tool is the reserve requirements of banks. It is stipulated in the Central Bank Act that the Monetary Board may prescribe reserve ratios from 10% to 50% against demand deposits and from 5% to 25% against time and savings deposits. Moreover, in periods of inflation the Board may prescribe ratios up to 100% against any future increase in the deposits of each bank, with the obligation for the Central Bank to pay interest on reserves in excess of the normal 50% and 25%. The danger is that this requirement is shunted by the foreign banks, which occupy an important position in the Philippine banking system and which, as mentioned above, can replenish their cash by importing capital from abroad. In this case, the Central Bank must impose tight exchange controls and ban any inflow of short term capital.

Selective credit controls include a whole range of measures. On this account, the Central Bank can : "(a) regulate interest rates on different types of credit, (b) establish maximum maturities for bank loans and investments and prescribe the kind and amount of securities to be required against various types of loans, (c) place ceilings on the amount of bank loans and investments or certain categories thereof, or place time limits on the rate of increase of such assets, (d) prescribe minimum ratios which the capital and surplus of banks bear to the volume of their assets or to specific categories thereof, and (e) prescribe minimum cash margins for the opening of letters of credit and relate the size of the required margin to the nature of the transaction to be financed¹⁾.

1) Golay, op. cit., p. 220

Resort to moral suasion is facilitated by the fact that all the principal bank offices are located in Manila and contact between the Central Bank and commercial banks is close. Moreover the power of the Central Bank to impose exchange and import controls heightens its influence.

As a final comment, it must be pointed out that the effectiveness of monetary policy also depends on the degree of monetization of the country, which can be measured by the ratio of the money supply to GNP, and on the relative importance of currency with respect to demand deposits.

IV.3.4. Foreign trade policies

The system of protection in Philippines has three principal objectives : 1) to foster industrialization by import substitution, 2) to cure the balance of payments deficit, and 3) to raise state revenues. There seems to be a persistent bias against exports in the Philippine trade policies; the bias was created by the overvaluation of the peso prior to the devaluation of 1962, and even after 1962, the bias persisted with the requirement that, until 1965, 20% of foreign exchange proceeds be converted at the old rate, which roughly corresponded to an export tax of 10%. And recently, in order to raise revenues for the government, export taxes were introduced in 1970.

The main instruments of protection consisted of import and exchange controls, nominal tariffs on imports, and effective protection through the tariff structure. For a short period before the devaluation of 1962, some system of multiple exchange rates was applied. Another subtle element of protection arose from the sales tax system. The tax rate was the same for both imported and domestically produced goods, but the base was different; for the category of imported goods, the tax rate applied to the c.i.f. price augmented by the tariff and a percentage markup, while for the domestic goods it applied only to that portion of manufacturer's

price that represented inputs not already taxed.

Import and exchange controls were first introduced in 1949-50 after a serious foreign exchange crisis. An Import Control Administration was created in 1950, replaced in 1951 by the Import Control Commission, and had the responsibility to apply the program of restrictions of imports of luxury and non-essential goods. In 1953, the Central Bank took over the charge and imposed exchange controls on the basis of a classification of commodities by order of priorities. Imports of non-essential and luxury consumer goods were severely restricted while a preferential treatment was given to producer goods. In addition, a 17% tax was imposed on the sale of foreign exchange during the period 1951-55, with exemptions given to "new and necessary" industries. This exchange premium was replaced by an import tax, which did not apply to imports of capital goods for "new and necessary" industries; it was to disappear in 1965. In 1959, the Central Bank was allowed to charge a fee of 25% on the sale of foreign exchange; this rate was reduced gradually and was eliminated in 1962. The exemptions granted to "new and necessary" industries and the preference given to capital goods opened a large breach in the system of import restrictions and created some sort of multiple exchange rates system. There also were black market exchange rates, which were higher than the official rate. In addition, in 1955, exporters were allowed to "barter" a small amount of their foreign exchange proceeds for essential imports; the average proportion of the "bartered" foreign exchanges was estimated to be 10%. This "barter trade" ceased in 1959.

By the end of the 1950s little discretion was left in exchange control policy. The imports were almost all labeled essential goods. Moreover, corruption and evasion from the control measures have spoiled the system. In 1960, with a persistent balance of payments deficit and under the pressure of the export sector, the government initiated a program of decontrol which ended in the devaluation of 1962. However, until November 1965, exporters were required to surrender 20% of their proceeds at the

the old rate. This corresponded to an export tax of about 10%.

Subsequently, difficulties in the balance of payments emerged again, culminating in a serious foreign exchange crisis in 1969, and controls were gradually reintroduced. The Monetary Board, then, established a free market for most of the foreign exchanges on February 1970. However, 80% of export earnings of the four major exports (logs, copra, sugar and copper) had to be converted at the old official par value. The introduction of the already mentioned export tax in early 1971 was to replace this measure.

The tariff structure also provided a powerful instrument of protection. The range of nominal tariffs went from very high rates for consumer goods, to less high rates for intermediate goods, and finally to very low rates for capital goods and raw materials, which could also be completely exempted. The effective protection rates, as calculated by Power and Sicat¹⁾, were still higher.

Lastly, a few additional words must be said about the Philippine exchange rate policies. From 1950 to 1961, the official exchange rate was fixed at the par value of 2.02 pesos per US dollar. In 1962 it was raised to 3.92 and stayed around this par value until 1970, when the peso was once again devalued and reached the level of 6.43 pesos per US dollar. In 1972, there was again a slight devaluation, raising the official par value to 6.73 pesos per dollar. After the devaluation and the floating of the dollar in 1973, a limited floating of the peso was also applied. From 1973 on, the official exchange rate hovered between the limits of 6.78 and 7.07 pesos per dollar.

Thus, the Philippine government has used both protective measures and

1) Power and Sicat, op. cit.

manipulations of the exchange rate to solve its balance of payments problem. The first devaluation in 1962 occurred at the same time that liberalization of trade was implemented; its rate of nearly 70% is higher than the rate of the second devaluation in 1970, which was about 60%. If we take into account the fact that trade controls were stricter in the period preceding 1962 than in the period preceding 1972, it seems that the choice of the rate at which the Peso was devalued was based on some shadow value of the exchange rate, as was indicated in section III.3.1. of Chapter III.

CHAPTER V

THE CASE OF THE PHILIPPINES : EMPIRICAL STUDY OF INFLATION AND

DEVALUATION

The general description of the Philippine economy and its mechanisms in chapter IV will serve as a background for the present chapter. In this chapter V, we shall investigate more thoroughly the problem of inflation and its consequences, of balance of payments crises and finally of policies of stabilization and devaluation. As we have pointed out in chapter I, whether money is the vehicle of inflationary pressures or the true cause of inflation, its role in the generation and duration of inflation is primordial. In the line of the neoclassical tradition, the integration of money into models such as the neoclassical monetary approach to inflation in a closed and an open economy has produced valuable explanations of the phenomenon of inflation and of its relation with growth and the balance of payments. Another question is to see how good these explanations are, when confronted with factual evidence and in particular, when we consider the case of the Philippines.

We shall also scrutinize the problem of the balance of payments in the Philippines. As in other LDCs, the balance of payments crises in the Philippines do not have only monetary causes; the structural causes are also of concern and may constitute an important and chronic element in the evolution of foreign exchange crises. Devaluation, as a solution for the balance of payments problem, has important consequences, not only on the external position of the country, but also on the

reallocation of its resources and on the long term structure of production and consumption. Finally, we shall examine the several attempts by the Philippine government to stabilize the internal situation of the economy.

V.1. Inflation in the Philippines

V.1.1. A general analysis of inflation in the Philippines

a) Some general indicators

We first begin our analysis by the examination of a series of graphs. The first series is represented in Chart 3 and Chart 4, which trace the evolution of the percentage rates of change of all price indices of the Philippines. We notice the very close development of the rate of the general WPI and of the rate of the WPI of domestic goods. Although the CPI does show a similar development, in some years its path diverges from the path of the WPI : thus in 1954, while the WPI decreased, the CPI slightly increased; in 1957 and 1961, the contrary happened; in 1963, the CPI was stabilized, while the WPI showed a sharp increase; and finally, the recent sharp increase of the inflation rate started its course in 1973 for the WPI and a year later for the CPI. As for the WPI of export goods, it is subject to wide fluctuations.

We can roughly distinguish four periods : the first goes from 1951 to 1955 and is marked by a substantially negative rate of inflation, both in the WPI and the CPI; the second period 1956-61 shows a mild inflation with an average rate of about 3.4%; the third, 1962-69, is characterized by a slightly higher average rate of inflation of about 4.5%; and the fourth, 1970-73, witnesses a remarkable acceleration of inflation, with an average rate of 19%. We already note that the devaluations of 1962 and of 1970 undeniably put an upward pressure on the price levels.

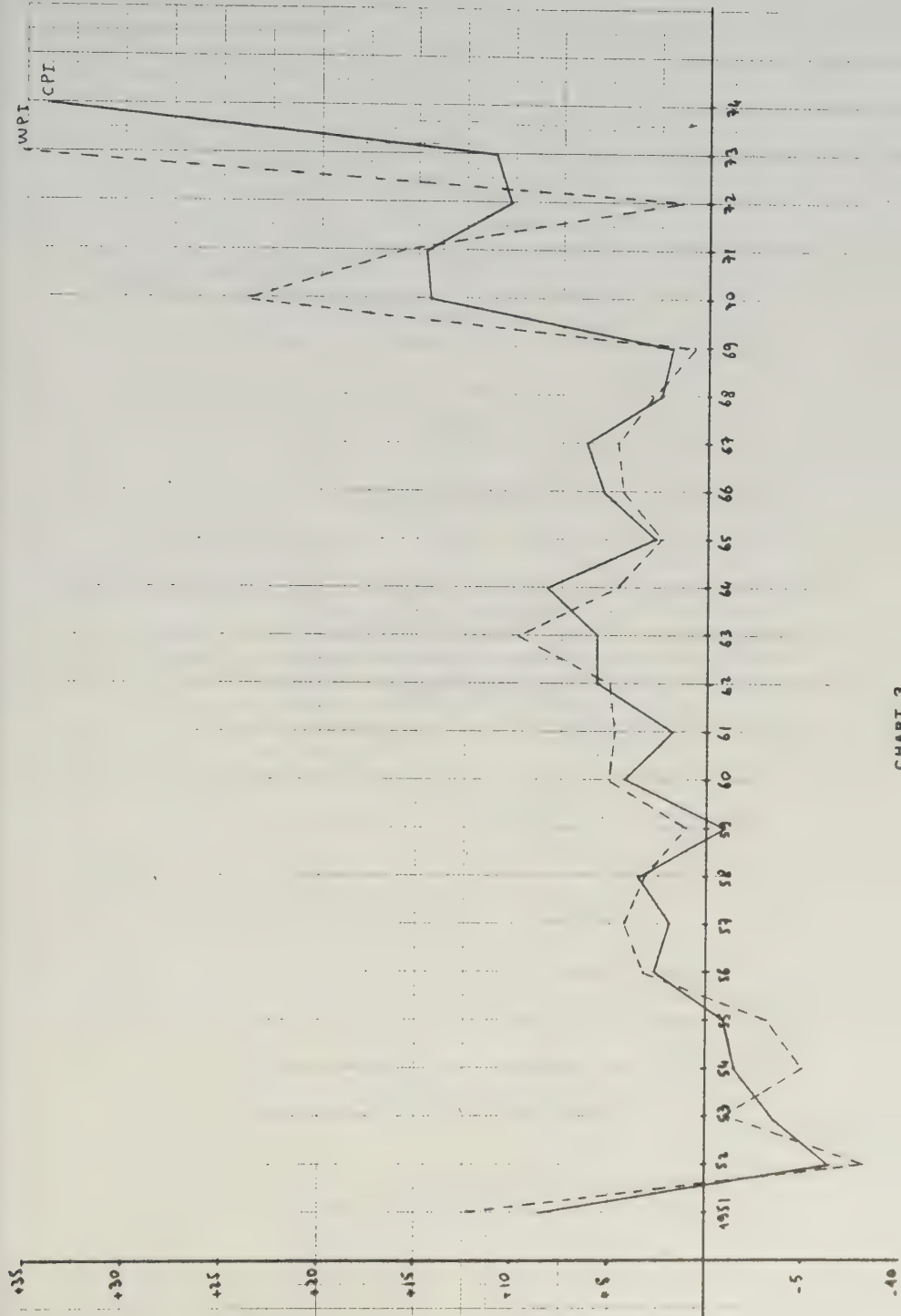


CHART 3

CHART 3

RATES OF INFLATION

----- = percentage rate of change of the Consumer Price
Index
----- = percentage rate of change of the general Whole-
sale Price Index

EARLY WPI
+3470

IMP. WPI

DOM. WPI

+35
+30
+25
+20
+15
+10
+5
-5
-10

1951

52

54

55

56

57

58

59

60

61

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63

64

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69

70

71

72

73

74

CHART 4

CHART 4

RATES OF INFLATION

- - - - - = percentage rate of change of the general
Wholesale Price Index
- = percentage rate of change of the Wholesale
Price Index of Home Goods
- _____ = percentage rate of change of the Wholesale
Price Index of Exports
- _____ = percentage rate of change of the Wholesale
Price Index of Imports

Another fact worth of mention is the approximate simultaneity in the change of the percentage rates of change of the general WPI and the domestic WPI of imported goods, especially in the periods 1951-56 and 1963-73. In the intervening period, there seems to be a lag of one year between the change in the WPI of imported goods and the general WPI.

Turning back to the problem of the slight divergence of the time paths of the rates of change of the WPI and CPI, this can be explained by the composition of the basket of goods, whose prices are used to compute the WPI and the CPI, and also by the presence of trade controls. In view of the observed relationship between the curves of the general WPI and the WPI of imported goods, and given the fact that the prices of imported goods are imposed upon the Philippine consumers by the world market conditions and by the discretionary import control measures of the government, we can say that the general WPI adjusts quite rapidly to a change in the WPI of imported goods. The CPI also adjusts to the domestic WPI of imported goods, but more slowly than the general WPI. As mentioned earlier, the composition of the basket of goods of the WPI differs from the one of the CPI : more traded goods are included in the WPI than in the CPI. The prices of the traded goods adjust more rapidly to a change in the import prices than the prices of the non-traded goods. Moreover, the CPI is also more heavily weighted with goods of first necessity whose prices can be controlled by the government.

A list of the different goods which enter into the basket of the WPI and the CPI and their corresponding weights is given below. It must also be added that the production of the domestic goods, which are included in the general WPI, depends to a large extent on imported materials. Taking this into consideration, we can say that the importance of imported goods for the movement of the WPI is larger than suggested by the direct share of 14.13%. In the CPI case, the food item has the highest weight; among the food-stuff that is consumed, most of the

products are domestically produced and only a residual is imported. The services, which are non-traded goods, also account for an important part of the CPI. Thus, compared to the WPI, the CPI contains more non-traded goods. In addition, in the CPI are included such goods as food-stuff of first necessity and public utilities, which often are under government price controls.

Composition of the basket of goods of the WPI :

<u>Goods</u>	<u>Weights</u>
Food	47.54%
Beverage and tobacco	8.08
Crude materials	11.08
Mineral fuels	3.31
Animal and vegetable oils and fats	1.23
Chemicals	4.74
Manufactured goods	12.19
Machinery and transport equipment	3.78
Miscellaneous	8.05
	100.00%

<u>Goods</u>	<u>Weights</u>
Domestic goods :	85.87%
Home consumed goods	(76.59)
Exported goods	(9.28)
Imported goods	14.13
	100.00%

Composition of the basket of goods of the CPI (Manila) :

<u>Goods</u>	<u>Weights</u>
Food	47.50%
Clothing	8.32
Rent	7.81
Fuel, light and water	5.23
Miscellaneous	31.14
	100.00%

Included in Miscellaneous : house furnishing, house-hold operations, personal care, education, medical care, transportation, beverages and tobacco, recreation, taxes.

Source : The Central Bank of the Philippines, Statistical Bulletin.

If we consider the levels of the price indices, instead of their rates of change, the close relationship of the CPI, the general WPI and the WPI of imported goods is remarkable. This is clearly shown in Chart 5.

The next series of graphs will show the effect of import and exchange controls on the domestic WPI of imported goods. The history of Philippine import controls is marked by different periods. The first period going from 1950 to 1962, the year of the first devaluation, is known as a period of high import and exchange controls. If we look at Chart 6, we notice that, precisely during this period, the domestic prices of imported goods, although on the whole following the upward and downward tendency of the dollar unit price of imported goods, differ greatly from the latter, particularly in the upswing. The next period, 1962-69, is a period of liberalization of imports; it corresponds on Chart 6 to a close similitude of the two curves of the domestic WPI and the unit

- S1 = Consumer Price Index
- S2 = Wholesale Price Index
- S3 = Import Wholesale Price Index

LA DISTANCE ENTRE DEUX POINTS EST EGALE A

3.02 UNITES

59.100

237.400

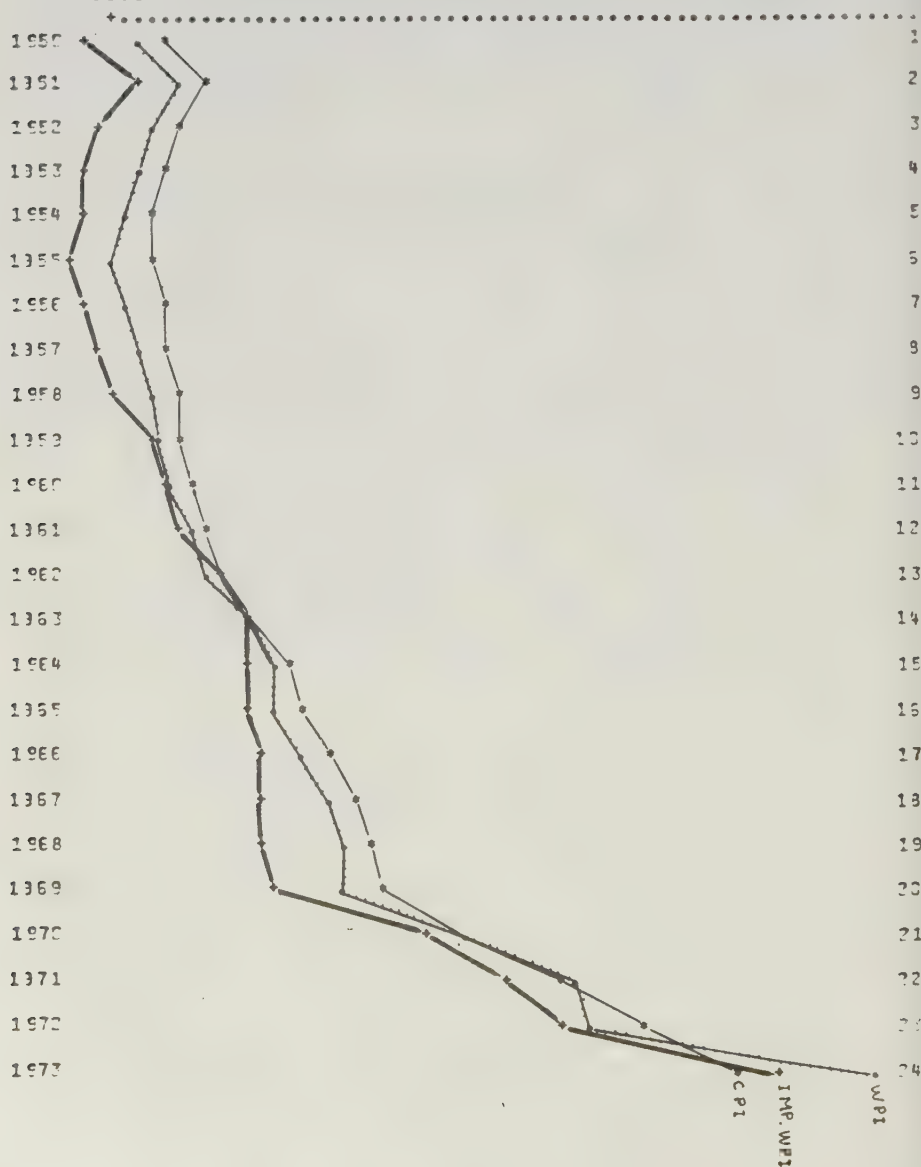


CHART 5

CHART 5

- * S1 = Consumer Price Index
- S2 = Wholesale Price Index
- + S3 = Import Wholesale Price Index

1963 = 100

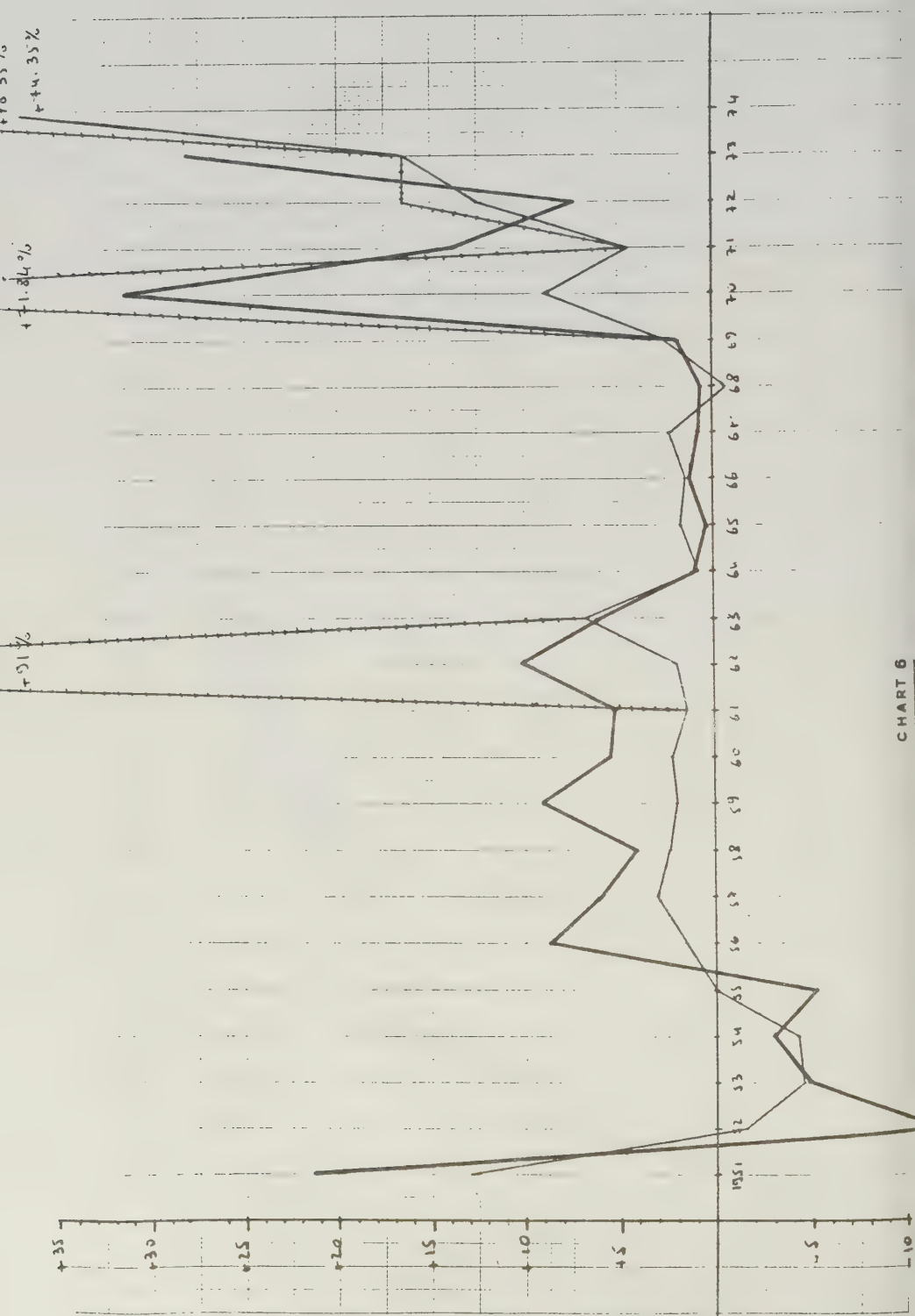


CHART 6

CHART 6

DOMESTIC AND DOLLAR PRICES OF IMPORTS

-  = percentage rate of change of the Wholesale Price Index of Imports
-  = percentage rate of change of the unit dollar price of imports
-  = combined percentage rate of change of the exchange rate and of the unit dollar price of imports

dollar price of imported goods. Lastly, the recent period 1970-73 witnesses a "free float" of the peso (or more exactly a frequent change of the parity of the peso), with some slight import control measures. The movements of the curves during this period cannot be analyzed as clearly as in the precedent spans of time, except that the curve of the combined percentage rates of change of the dollar unit import price and of the exchange rate always lies above the curve of the dollar unit price of imports. In 1971 and 1972, the growth rate of the domestic WPI of imported goods significantly decreases, this can be explained, with caution, by its adjustment to the shock of the devaluation of 1970. In 1973-74, import prices, both in \$US and in Peso, display a sharp increase, mainly as a consequence of the boom in the international market of primary products and of the oil crisis; during these years, the domestic prices of imported goods rise more than their equivalent in \$US. It then follows, from the examination of Chart 6, that import controls produce a domestic price of imported goods higher than the dollar price.

The next Chart 7 will inform us of the movements in the money supply and domestic credit of the Philippines and, consequently, of the government willingness to conduct a tight or easy monetary policy. As the Philippine government has little ability to stabilize the economy by fiscal measures, the movements in domestic credit also indicate its efforts of stabilization. From Chart 7, it appears that during the periods 1954-57, 1966-67 and 1974, domestic credit undergoes a drastic expansion. The curve of the money supply M_2 (currency + demand deposits + time and savings deposits) follows rather faithfully the curve of domestic credit, with some exceptions, however. Thus in 1951 and in 1954, the rate of change of M_2 (and of M_1) is negative, while that of domestic credit is positive; this reveals a depletion of foreign exchange reserves to finance the balance of payments deficit consequent to domestic credit expansion. On the contrary, in 1973 (and in a lesser degree in 1971), the Philippine economy enjoyed an export boom, which

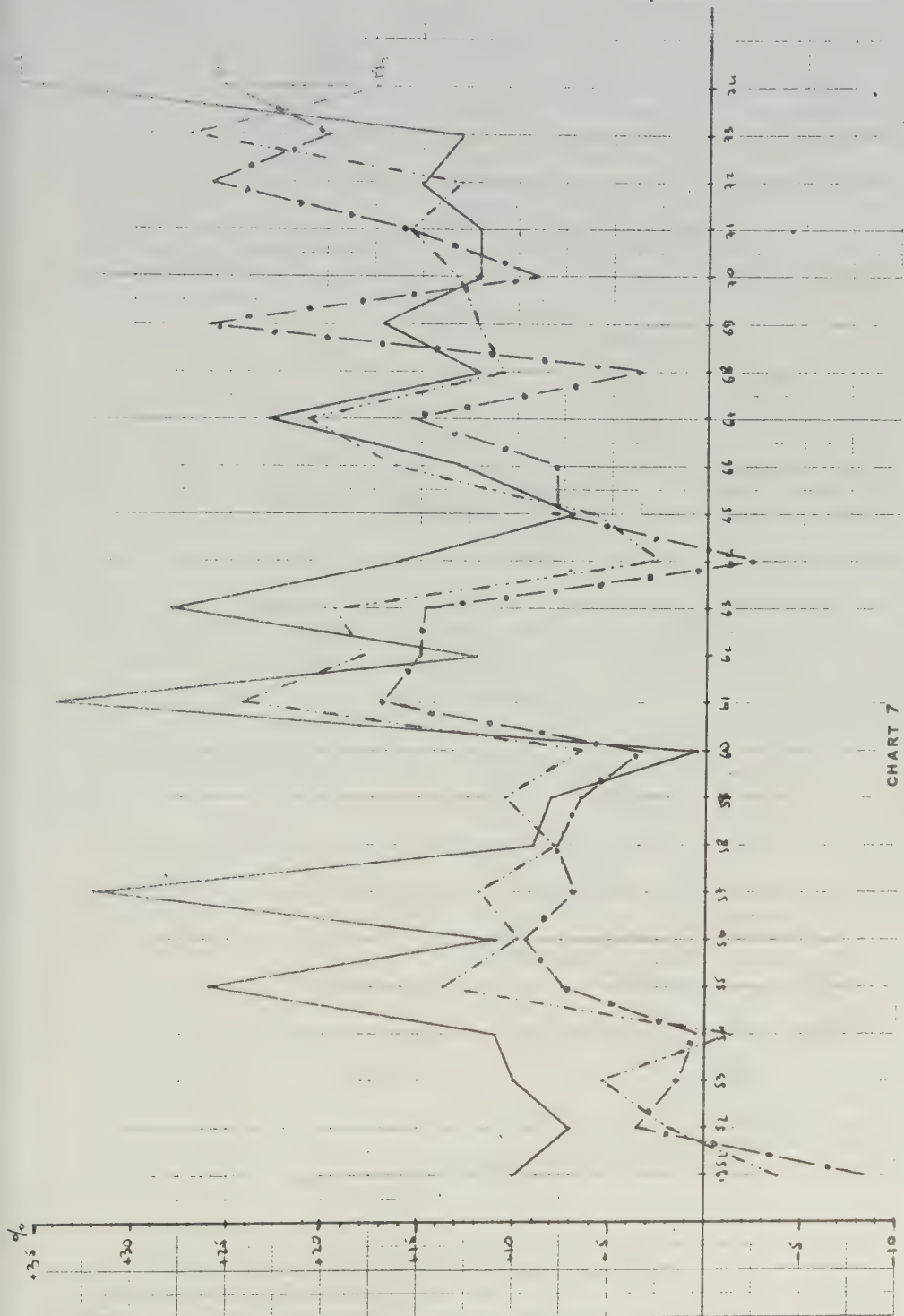


CHART 7

MONEY SUPPLY AND DOMESTIC CREDIT

	=	percentage rate of change of domestic credit
	=	percentage rate of change of M_1 (currency + demand deposits)
	=	percentage rate of change of M_2 (currency + demand deposits + time and savings deposits)

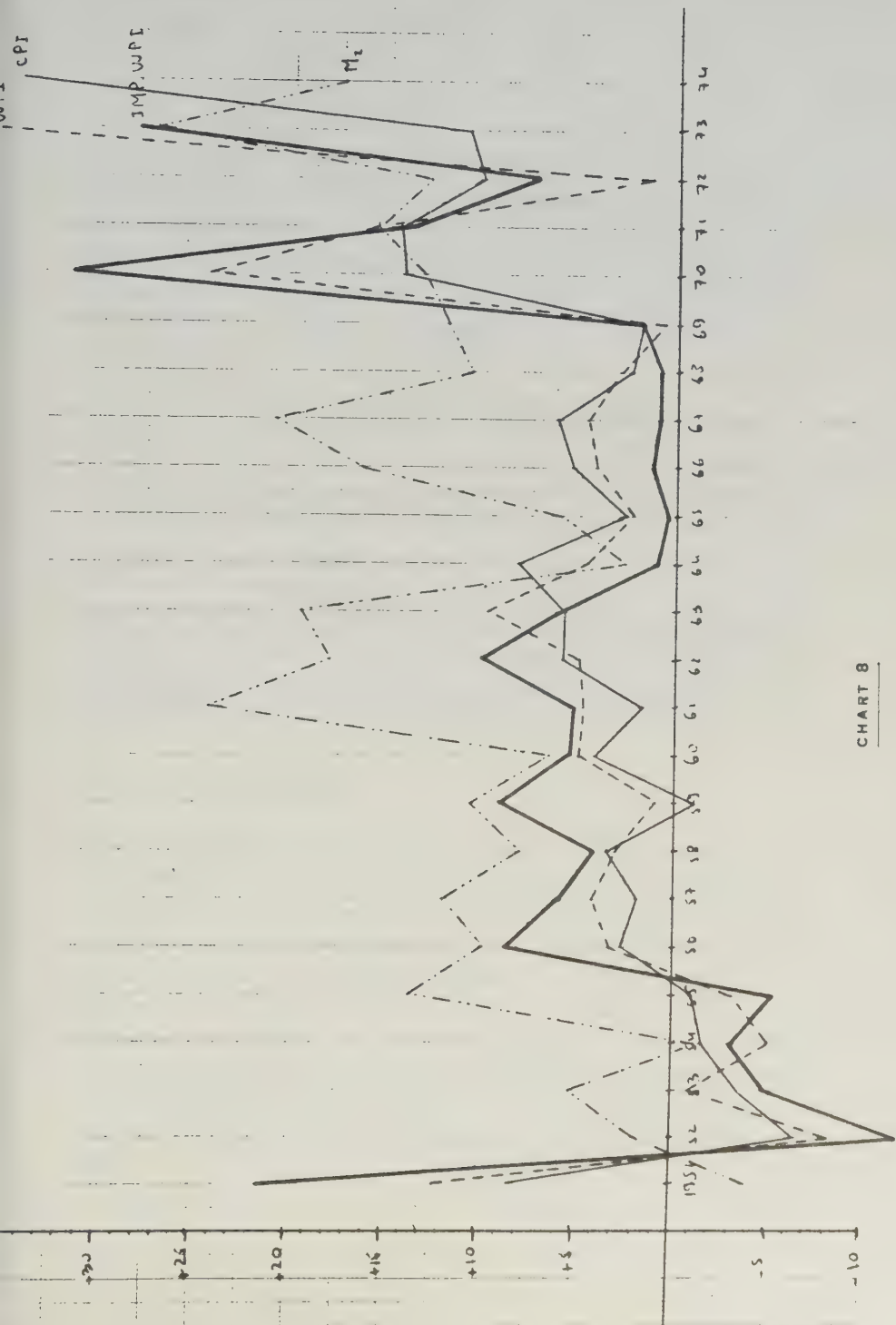


CHART 8

CHART 8

INFLATION, MONEY SUPPLY AND IMPORT PRICE

_____	=	percentage rate of change of the Consumer Price Index
-----	=	percentage rate of change of the general Wholesale Price Index
—————	=	percentage rate of change of the Wholesale Price Index of Imports
— ······	=	percentage rate of change of the money supply (M_2)

produces a balance of payments surplus, (which in 1971 is the consequence of the devaluation of 1970), and an uncommon increase in foreign exchange receipts; this can explain the sharp increase of M_2 , concomitant with a slight decrease in domestic credit (and in 1971, a slight increase in M_2 is accompanied by a stable domestic credit). On the whole, the effect of changes in domestic credit on total money supply is smoothened by the changes in foreign exchange reserves.

Finally, looking at Chart 8, we see that the curves of WPI and CPI exhibit an undeniable similarity with the curve of the domestic WPI of imported goods, during the periods 1951-56 and 1964-74, although in 1954, there appears to be some independent influence of the money supply M_2 on the WPI. The period 1957-63 is more complex and at first sight, we can interpret, with caution, that the conjunction of M_2 and domestic WPI of imported goods produces a lagged effect on the general WPI and CPI. Nevertheless, we can conclude that, on the whole, the domestic WPI of imported goods has a strong influence on the CPI and the general WPI and the money supply exerts a weaker influence.

b) Inflation and growth

In this section we shall discuss, on the basis of Philippine data, the problem of the relation between inflation and growth, which was pointed out in chapters I and II. Monetary factors can play an important role in economic growth; but this does not mean that money is the only determinant or even the dominant source of growth. Other factors such as productivity of labor and capital, technical and managerial improvement etc. probably have considerably stronger influence on growth. Therefore, the most we can say about the analysis which follows is that it treats but one side of the problem of growth; the neglect of other factors is not intended as a suggestion that these are unimportant.

A brief summary of the propositions of chapters I and II is necessary. The inflation tax argument states that the government, by issuing money, levies a tax on money holders and uses part or whole of this tax to finance its investment programs, which will foster growth. As a counterpart, the ensuing inflation will decrease the stock of real balances held by the public. It is found that in the long run this sort of inflation tax is very costly in terms of loss of welfare and a small increase in real output requires a correspondent very high rate of inflation. On the other hand, if real balances enter as an input in the production process, the decrease in the stock of real balances, consequent to an increase in the rate of inflation, can induce a reduction in real output. But physical capital is also an important input in the production process and an interesting issue is whether real balances compete with or are complementary to physical capital. In the latter case, a decrease in real balances is likely to lower the production of real output, unless sizable countervailing government investment expenditures neutralize or reverse this effect. It was contended that, given existing conditions in LDCs, there is a great probability that real balances and physical capital are complementary and, hence, a decrease in the stock of real balances will induce a decrease in real output.

The effort of the government to stabilize the economy through management of the money supply may have short run depressive effects on real income. It was found that a substantial monetary reduction induces a decline in real output, before any reduction in price inflation is obtained.

The difficulty with this interpretation of the relation between inflation and growth is that it is applied to a closed economy. In the context of an open economy, growth can be influenced in a large measure by external factors, such as an export boom created by very favorable external demand conditions. Moreover, this analysis assumes that expectations are static and that the demand for money is a function of the domestic rate of inflation. In an open economy, the domestic rate of

inflation is not only determined by the domestic money supply, but also, and largely by the world rate of inflation (at least in a regime of fixed exchange rates). The demand for money can depend on an expected rate of inflation (which is empirically verified by studies of Cagan, Diz, etc., mentioned in chapter I). It is also possible that the expected rate of inflation depends on the foreign rate of inflation (represented, for example, by the rate of increase of import prices), and we shall see in section V.1.2. that this hypothesis is quite plausible.

Nevertheless, the above proposition on inflation and growth is still valid, although its validity is weakened by the openness of an economy. In the case of the Philippines, an examination of the data reported in Table 20 gives some support to the proposition laid down above. There seems to be marked correlation between the real growth and real balances. Looking first at representative years where the real rate of growth is particularly low (absolutely and relatively to the preceding and following years), that is the years 1951, 1954 and especially 1960 and 1964, it is noteworthy that in those years the stocks of real and nominal balances are decreasing or are increasing at a much lower rate relatively to the preceding and following years. Thus, Chart 7 shows that 1951, 1954, 1960 and 1964 are trough points of the M_1 and M_2 curves. Table 17 shows a percentage rate of increase of real balances (M_2/WPI) of -14.30% for 1951, of 3.87% for 1954 (compared to 6.3% for 1953 and 17.3% for 1955), of 1.53% for 1960 (compared to 9.40% for 1959 and 18.90% for 1961), and of -1.86% for 1964. In addition, the two years 1970 and 1974 are characterized by a slightly low rate of growth and negative rate of increase of real balances.

The two particular years 1972 and 1973 are worth mentioning, because it seems that the monetary factors have no influence on growth in these years : in 1972, economic growth slackened and this was mainly due to disastrous climatic conditions; in 1973 the uncommonly high rate of growth was the consequence of an export boom.

Table 17

Philippines : Money, Prices and Growth

Year	M ₂ /CPI	M ₂ /WPI	Percent. rate of change of (1)	Percent. rate of change of (2)	Discount rate	Percent. rate of change of CPI	Percent. rate of change of WPI	Percent. rate of increase of real GNP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1950	18.04	19.92			2.00			
1951	16.02	17.07	-11.20	-14.31	2.00	8.33	12.27	4.7
1952	17.44	18.92	8.86	10.84	2.00	-6.47	-8.18	8.7
1953	19.00	20.11	8.94	6.29	2.00	-3.46	-1.00	7.8
1954	19.04	20.89	0.21	3.88	1.50	-1.48	-4.99	5.4
1955	21.85	24.51	14.76	17.33	1.50	-1.00	-3.16	7.8
1956	23.35	26.06	6.86	6.32	1.50	2.66	3.27	5.1
1957	25.65	27.96	9.85	7.29	4.50	1.85	4.21	4.4
1958	26.74	29.26	4.25	4.65	4.50	3.51	3.10	4.2
1959	29.86	32.01	11.67	9.40	6.50	-1.05	1.00	5.9
1960	30.54	32.50	2.28	1.53	5.00	4.14	4.94	2.6
1961	37.32	38.56	22.20	18.65	5.00	1.70	4.72	6.5
1962	41.68	43.33	11.68	12.37	6.00	5.69	5.05	6.1
1963	47.17	17.17	13.17	8.86	6.00	5.60	9.77	7.4
1964	44.75	46.29	-5.13	-1.87	6.00	8.20	4.60	2.5
1965	46.27	48.00	3.40	3.69	6.00	2.59	2.29	5.5
1966	51.08	53.55	10.40	11.56	4.75	5.41	4.30	6.0
1967	58.12	61.85	13.78	15.50	6.00	6.24	4.66	6.2
1968	62.80	66.51	8.05	7.53	7.50	2.41	2.91	6.4
1969	69.07	73.98	9.98	11.23	10.00	1.89	0.75	6.7
1970	68.33	67.74	-1.07	-8.43	10.00	14.42	23.61	5.0
1971	68.94	67.67	0.89	-0.10	10.00	14.56	15.70	6.5
1972	70.68	75.67	2.52	11.38	10.00	10.24	1.47	4.3
1973	80.95	70.92	14.53	-5.90	10.00	10.99	35.22	9.4
1974	70.70	54.75	-12.66	-22.80	6.00	34.00	52.00	5.2

Source : Data compiled from : International Financial Statistics, IMF.

Yearbook of National Accounts Statistics, United Nations

In regard of these facts, we can say that there is some correlation between the rates of growth of output and of real balances, though we cannot ascertain the direction of this relationship, that is, whether the rate of growth of real balances influences the rate of growth of output or vice versa. But if we have information on the manipulation of the stock of money by the monetary authorities (by changing the rate of domestic credit creation), we can more or less assert that the direction of the changes goes from money to output (if the changes in these two variables occur in comparable periods).

Chart 7 also shows that in 1960, 1964 and 1970, there is a sharp cut in domestic credit (particularly in 1960). From Table 17, we see that the rate of growth in those years are rather low. These reductions in domestic credit do not succeed in the immediate lowering of the inflation rate, but, instead, a decrease in real output has currently occurred in the same years, particularly in 1960 and 1964, as is seen above. In 1960, the rate of inflation (of the CPI and the WPI) was increasing. In 1964, the rate of inflation of the CPI was increasing, while the one of the general WPI was decreasing, (the domestic WPI of imported goods was also decreasing at a substantial rate). In 1970, the rate of inflation was increasing, consequently to the devaluation of the Peso. We can boldly conclude that a cut in domestic credit leads to a reduction in real output, at least at a first stage, and also that in an open economy, the price level is difficultly stabilized, because of imported inflation.

The next question which must be treated is the relation between real balances and their real rate of return. This is a difficult matter, because as we have pointed out earlier, real balances can depend on the expected rate of inflation, which, in turn, can depend on some relation between the domestic and foreign rates of inflation. In the lack of any precise data on the rate of interest paid on time and savings deposits, we have produced data on the discount rate, with the hope that it is an indication of the former rate, (insofar as commercial banks would pay higher interests on time and savings deposits to attract funds,

when the general rate of interest is also high). The combination of the discount rate and the rate of inflation would give some hints on the real rate of return of real balances. We can find, however, no clear-cut relationship between this so-called real rate of return and real balances.

Finally, with respect to the alleged complementarity of real balances and physical capital, we can find not even a shade of some relationship between these two magnitudes. In fact, looking at Table 18 which gives the figures on the domestic gross fixed capital formation, the gross capital formation and the gross domestic savings, as percentages of GNP, we see that the rate of capital formation is steadily growing, with, however, a slight reduction in the period 1969-73, where the discount rate was raised to 10%. This is in accord with the remark made in chapter IV on the widespread excess capacity of Philippine industrial enterprises. In chapter IV, we have mentioned that the presence of excess capacity can be explained by the bias towards capital-intensive production processes. This "hoarding" of capital is made possible by the imperfections in the capital market, which are characterized by a low ceiling interest rate and the overvaluation of the Peso.

c) The monetary approach to inflation

Before proceeding to the test of a reduced form of the monetary model with expectations of chapter I, we shall make some simple exploratory calculations to verify the working of the monetary hypotheses in the context of the Philippine economy. In particular, we would like to find out an answer to three specific questions. First, does the government finance its budget deficit from an increase in domestic credit, and consequently in the money supply? Second, does domestic credit induce a reduction in the stock of reserves, i.e. a balance of payments deficit, mainly through an increase in imports? Third, is there any compensating change in domestic credit, consequent to changes in the stock of reserves? The first question is related to the monetarist contention that inflation is due to the government financing of its

Table 18

Philippines : Savings and capital formation (in nominal terms) as
percentage shares of (nominal) GNP

Year	Gross fixed capital for- mation / GNP	Gross capi- tal forma- tion / GNP	Gross do- mestic sa- vings / GNP
1950	7.3	8.5	9.3
1951	6.7	7.5	6.1
1952	6.4	7.3	6.8
1953	6.9	8.1	7.4
1954	6.8	8.7	7.3
1955	7.1	8.9	6.0
1956	8.2	9.1	8.5
1957	8.8	10.2	7.3
1958	8.1	8.9	8.2
1959	8.2	8.8	9.8
1960	9.9	9.8	7.4
1961	12.8	13.4	10.4
1962	18.0	19.1	11.0
1963	18.8	20.0	19.1
1964	21.1	22.8	19.2
1965	20.3	21.9	20.2
1966	19.0	20.4	22.3
1967	21.2	22.9	19.6
1968	20.4	22.2	17.0
1969	18.8	20.6	15.9
1970	18.7	21.2	18.8
1971	18.8	20.9	19.0
1972	18.3	20.5	18.1
1973	18.1	20.7	22.7
1974	21.5	25.0	20.0

Source : Data compiled from : Yearbook of National Accounts,
United Nations.

budget deficit by an increase in domestic credit. The second question refers to the monetary approach of the balance of payments. As for the last question, a positive answer has several meanings. The first meaning is that the government was pursuing some sterilization policy to counteract the movements in foreign exchanges. It could also mean that the balance of payments deficit, which is chronic in the Philippines, is fed by domestic credit creation; this corresponds to the proposition put forward by the monetarists that long run balance of payments problems are essentially a monetary phenomenon, that is a persistent balance of payments deficit requires continuing credit creation.

To answer the first question, four simple bivariate linear regressions, for the period going from 1950 to 1972, are done. The first equation concerns the regression of the rate of change of domestic credit on the current budget deficit¹⁾. In the second equation, the rate of change of the money supply is regressed on the current government budget deficit. In the third and fourth equations, we shall use as the exogenous variable the cumulated value of the current budget deficit and the last year budget deficit. There are several reasons to justify the use of this new variable. The data on domestic credit are end of year data, taken from the International Financial Statistics, while the data on budget deficits for the period from 1950 to 1962, taken from the Economic Survey of Asia and the Far East, are data for the Philippine fiscal year, which ends on June 30. From 1963 to 1972, the IFS contain end of year data on budget deficit and these data are used in our regressions. Thus, the cumulation of current and one-year lagged values of the

1) In the very simplified monetary creation process described on p. 159-160, the government budget deficit, being a flow magnitude, determines a change in another flow magnitude, which is the rate of change of either domestic credit or money supply.

budget deficit will diminish the differences in the measures of the data. Moreover, the introduction of a one-year lagged value of budget deficit will also take into account the lag in the creation of domestic credit, following the government deficit expenditures. It happens that the use of this cumulated value considerably increase the value of the coefficient of determination of the equations. The results of the four regressions are given below.

Notations : ΔDC = change in domestic credit

ΔMO = change in money supply

BD = government budget deficit (the subscript -1 indicates a one-year lagged value).

The figures in parentheses are standard errors.

$$\Delta DC = 472.52 + 1.45 BD \quad R^2 = .44 \quad (1)$$

(119.70) (.36)

$$\Delta MO = 378.21 + 1.92 BD \quad R^2 = .50 \quad (2)$$

(141.87) (.43)

$$\Delta DC = 351.12 + 1.28 (BD + BD_{-1}) \quad R^2 = .61 \quad (3)$$

(108.65) (.23)

$$\Delta MO = 250.75 + 1.57 (BD + BD_{-1}) \quad R^2 = .59 \quad (4)$$

(138.40) (.29)

The values of the R^2 are just acceptable for the two first equations and more satisfactory for the two last equations. The values of the coefficients of regression are quite significant. In view of these results, it can be concluded that the government budget does influence the domestic money supply, but their relationship is not very close. This is not surprising in an economy dominated by the private enterprise, where government expenditures constitute a small share of total

national expenditures. In addition, the Philippine government has, on several occasions, financed its budget deficit by ad hoc external funds. such as foreign aid and external borrowing.

We now turn to the second question and investigate the relationship between domestic credit and foreign exchange reserves. In the framework of the monetary approach, in the absence of capital flows and of any extra (unexplained) inflow or outflow of foreign exchanges, the balance of trade deficit is identical to a negative rate of change of the stock of reserves. However, in the case of the Philippines, the extra payments or receipts in foreign exchange, such as foreign aid, remittance of earnings on foreign direct investment, payments of interests on external debt etc., are important in the change of the stock of reserves. In a first stage, we have tried to regress the change in the stock of reserves with some current or lagged value of domestic credit; we obtained quite unsatisfactory results. We then regressed imports on domestic credit and this gave us strikingly good results, as is shown in the following equations :

$$\begin{aligned} \text{IMP} &= 64.24 + 0.56 \text{ DC} & R^2 &= 0.97 & (5) \\ &(165.57) \quad (0.02) \end{aligned}$$

$$\begin{aligned} \ln \text{IMP} &= 1.02 + 0.82 \ln \text{DC} & R^2 &= .95 & (6) \\ &(.32) \quad (.04) \end{aligned}$$

where IMP = peso value of imports

DC = domestic credit

The regression produced a very high elasticity of imports with respect to domestic credit and a very high coefficient of determination. If we assume that, for the Philippines, the foreign demand for exports can be taken as exogenously given, the deficit in the balance of trade is therefore highly responsive to a change in domestic credit.

However, the high values of the R^2 and of the elasticity can be attributed to the common trend of the variables. In order to eliminate the influence of time trend, we ran two additional equations, in terms of rates of change :

$$\Delta \text{ IMP} = -78.78 + 0.74 \Delta \text{ DC} \quad R^2 = 0.45 \quad (7)$$

(184.32) (0.18)

$$\Delta \text{ IMP} = -151.00 + 0.91 \Delta \text{ DC}_{-1} \quad R^2 = 0.56 \quad (7')$$

(172.25) (0.18)

Similar equations were run in terms of change of the logarithms, but they gave quite disappointing results. Equations (7) and, particularly, (7'), with an acceptable R^2 and significant regression coefficients, show a high responsiveness of imports to domestic credit.

Finally, in answer to the last question on the compensating movement in domestic credit, we ran three equations. In the first equation, domestic credit is regressed on the current value of the stock of reserves and this gives us very poor results. In the second equation, a one-year lagged value of the stock of reserves is used as the explanatory variable; the results are slightly improved and the coefficient has the expected negative sign, although the value of the coefficient of determination remains quite unsatisfactory. By using a two-year lagged value of the stock of reserves as the explanatory variable in the third equation, we have obtained a high coefficient of determination and a significant coefficient of regression with the expected negative sign. The results for the three equations are given below.

$$\text{DC} = 5570.79 + 1.07 \text{ R} \quad R^2 = .05 \quad (8)$$

(1137.79) (.97)

$$\text{DC} = 7079.24 - 7.51 \text{ R}_{-1} \quad R^2 = .44 \quad (8')$$

(888.11) (1.85)

$$\begin{aligned} \text{DC} &= 7455.37 - 10.69 R_{-2} & R^2 &= .89 & (8'') \\ & (418.57) \quad (.89) \end{aligned}$$

However, these good results can be attributed to the effect of a common trend of domestic credit and foreign reserves, the former keeping increasing through time and the latter keeping decreasing through time. To verify this hypothesis, we made five more regressions. In the first two equations, we regressed the yearly rates of change of domestic credit on the yearly rates of change of reserves, lagged by one and two years. We obtained quite poor results, with the R^2 approaching zero. In the three last equations, we regressed the yearly rates of change of domestic credit on the yearly rates of change of reserves (the current, one-year and two-year lagged values), and on the cumulated values of current and one-year lagged budget deficit. The results are reproduced below :

$$\begin{aligned} \Delta \text{DC} &= 370.183 - 0.0291 \Delta R + 1.255 (\text{BD}_{-1} + \text{BD}) & (9) \\ & (134.552) \quad (0.279) & (0.284) \end{aligned}$$

$$R^2 = 0.56472 \qquad \text{D.W.} = 1.61294$$

$$\begin{aligned} \Delta \text{DC} &= 381.686 + 1.153 \Delta R_{-1} + 1.466 (\text{BD}_{-1} + \text{BD}) & (9') \\ & (111.502) \quad (0.458) & (0.243) \end{aligned}$$

$$R^2 = 0.68271 \qquad \text{D.W.} = 1.42072$$

$$\begin{aligned} \Delta \text{DC} &= 362.148 - 0.143 \Delta R_{-2} + 1.249 (\text{BD}_{-1} + \text{BD}) & (9'') \\ & (136.234) \quad (0.410) & (0.265) \end{aligned}$$

$$R^2 = 0.56654 \qquad \text{D.W.} = 1.61255$$

Except in equation (9'), where the coefficient of ΔR_{-1} has a positive sign and is of some significance, the coefficient of ΔR and ΔR_{-2} in the other equations are not significant at all. The coefficients of

($BD_{-1} + BD$) are always significant. In view of these results, though far from definite, we can however conclude that the government has no systematic sterilization policy and that the change in domestic credit is dominantly influenced by the government budget deficit.

In summary, the monetary hypotheses seem to be valid for the case of the Philippines, although their working requires some time-lag. This encourages us in undertaking the test of a reduced form of our monetary model with expectations.

V.1.2. An econometric model of inflation in the Philippines

The econometric model which will be estimated consists of two simultaneous equations, which are derived from a reduced form of the theoretical model of chapter I. All the variables are in logarithmic form and the meaning of the symbol used is indicated as follows :

m = current stock of real money balances

m^d = demand for real money balances

p^e = short run expected price level

P^* = long run expected price level

PI = import price level (foreign price level); the index used here is the domestic WPI of imported goods

P = domestic price level

y = real income

DC = domestic credit

The subscript -1 implies a one-period lagged value of the variable.

a) The reduced form model

This reduced form theoretical model contains six equations.

(1) Short run expected price level :

$$P^e = P + \lambda(P^* - P) \quad (1)$$

(2) Long run expected price level :

$$P^* = \delta PI \quad (2)$$

(3) Demand for real balances :

$$\begin{aligned} m^d &= a + by + c(P - P^e) \\ &= a + by + c\lambda P - c\lambda\delta PI \end{aligned} \quad (3)$$

(4) The monetary adjustment equation :

$$\Delta m = \alpha(m^d - m_{-1}) \quad (4)$$

In an open economy, people react to an excess supply of real balances by spending on domestic and foreign goods; this will raise the domestic price level and deteriorate the balance of payments.

(5) The price adjustment equation :

$$\Delta P = \beta(PI - P_{-1}) + \gamma(DC - DC^*) \quad (5)$$

The domestic price level adjusts to a discrepancy between the foreign price level and the last period domestic price level and to a discrepancy between the current value and a "neutral"¹⁾ value of domestic

1) The introduction of this concept of "neutral" domestic credit to capture the effect of domestic credit on the price level is one of the creative suggestions of Hans Genberg, to whom I am much indebted.

credit, which will be defined in the following section.

When $PI = P_{-1}$ and $DC = DC^*$, therefore $\Delta P = 0$. Moreover, if the economic system is free to adjust to an exogenous change in domestic credit or in the foreign price level, and if the proportion of non-traded goods in domestic expenditures is negligible, then it is legitimate to expect that the speed of adjustment β and the reaction coefficient γ are high. But they can be reduced by two kinds of factors. First, a big share of non-traded goods in domestic expenditures and a control on import prices will reduce β . Secondly, a control of the prices of domestic goods and a high responsiveness of reserve flows to excess domestic supply of money will lower γ .

(6) The "neutral" domestic credit :

DC^* is such defined that if $DC = DC^*$, there is no effect of domestic credit on the price level, which is only influenced by the foreign price level, and the rate of change of the nominal supply of money is exactly equal to the rate of change of the stock of foreign reserves (which implies that the rate of change of domestic credit is also equal to the rate of change of reserves). Thus, when $DC = DC^*$:

$$\begin{aligned}\Delta P &= \beta(PI - P_{-1}) \\ M^* - M_{-1} &= R^* - R_{-1} = DC^* - DC_{-1}\end{aligned}$$

where M = logarithm of the nominal supply of money

R = logarithm of the stock of foreign reserves

The nominal stock of money is equal to the sum of foreign reserves and domestic credit. By a linear approximation of non-linear equations, the logarithm of the nominal stock of money is a weighted sum of the logarithms of reserves and domestic credit :

$$M = dR + (1-d) DC$$

The weights d and $(1-d)$ can be expressed in terms either of initial values or of mean values of the nominal stock of money, the stock of foreign reserves and the outstanding domestic credit. Thus, d is either the ratio of initial values of reserves and nominal stock of money or the ratio of their mean values; correspondingly, $(1-d)$ is either the ratio of initial values of domestic credit and nominal stock of money or the ratio of their mean values.

When $DC = DC^*$, it follows that :

$$\Delta m = \Delta M - \Delta P$$

$$\Delta m = d(DC^* - DC_{-1}) + (1-d)(DC^* - DC_{-1}) - \beta(P - P_{-1}) = \alpha(m^d - m_{-1})$$

and

$$DC^* = DC_{-1} - \alpha(m^d - m_{-1}) + \beta(P - P_{-1}) \quad (6)$$

We have proceeded to two separate tests, one for the CPI and one for the WPI. The divergence in the results of these two tests is interesting, insofar as the basket of goods whose prices are used to compile a general price index contains more non-traded goods and goods of first necessity in the case of the CPI than in the case of the WPI.

We have used the domestic WPI of imported goods as representative of the (exogenous) import price level; this index already reflects the effect of exchange and import controls on the domestic prices of imported goods, so that β is not influenced by the degree of trade controls.

b) The estimation

Substituting equations (1), (2) and (3) into equation (4) yields :

$$m - m_{-1} = \alpha(a + by + c\lambda P - c\lambda\delta PI - m_{-1}) \quad (4')$$

This equation will be estimated in the form :

$$m = (1-\alpha)m_{-1} + \alpha by + \alpha c \lambda P - \alpha c \lambda \delta PI + \alpha a \quad (4'')$$

Similarly, substituting equation (6) into equations (5) yields the following equation for the domestic price level:

$$P - P_{-1} = \beta(PI - P_{-1}) + \gamma[D - D_{-1} + \alpha(m^d_{-1} - m_{-1}) + \beta(PI - P_{-1})] \quad (5')$$

Equation (5') is rearranged to obtain a final equation which will be estimated :

$$\dot{P} = [1 - \beta(1-\gamma)] P_{-1} + \beta(1-\gamma) PI - \gamma m + \gamma m_{-1} + \gamma DC - \gamma DC_{-1} \quad (5'')$$

Thus the simultaneous model which will be estimated is :

$$m = (A) m_{-1} + (B) y + (C) P + (D) PI + E \quad (4'')$$

$$P = (F) P_{-1} + (G) PI - (H) m + (H) m_{-1} + (H) DC - (H) DC_{-1} + I \quad (5'')$$

where :

A, B, C, ... I are the coefficients to be estimated
the predetermined variables are m_{-1} , P_{-1} , y , PI , DC_{-1} , DC .

The formation of expectations, as is specified in the theoretical model, if correct, must necessarily give a negative parameter D . We have used the Full-Information-Maximum-Likelihood (FIML) with non-linear restrictions method¹⁾ of estimation.

1) The FIML method is performed by the use of the RESIMUL program written by C.R. Wymer.

The FIML estimates

The values of the coefficients and of the structural parameters are given simultaneously for both cases CPI and WPI.

A. Coefficients

A.1. First equation : m as dependent variable

Independent variables	Coefficients		t - values	
	<u>CPI</u>	<u>WPI</u>	<u>CPI</u>	<u>WPI</u>
P	0.655	1.127	2.63	2.14
m_{-1}	0.635	0.584	6.66	5.16
y	0.511	0.580	4.07	4.13
PI	-0.482	-1.016	2.27	2.07
constant	-1.988	-1.889	4.95	4.23
Variance of structural residual :		<u>CPI</u> 0.0050		<u>WPI</u> 0.0065
Variance of endogenous variable :		0.2960		0.2626
Mean Square Error :		0.0030		0.0021
R^2 :		0.9831		0.9751

A.2. Second equation : P as dependent variable

Independent variables	Coefficients		t - values	
	<u>CPI</u>	<u>WPI</u>	<u>CPI</u>	<u>WPI</u>
P_{-1}	0.662	0.400	16.25	5.40
m	-0.114	-0.170	2.62	2.20
m_{-1}	0.114	0.170	2.62	2.20
PI	0.337	0.600	8.28	8.09
D_{-1}	-0.114	-0.170	2.62	2.20
D	0.114	0.170	2.62	2.20
constant	0.064	0.060	2.58	1.60

	<u>CPI</u>	<u>WPI</u>
Variance of structural residual :	0.0006	0.0013
Variance of endogenous variable :	0.0808	0.1039
Mean Square Error :	0.0008	0.0016
R^2 :	0.9925	0.9873

B. Parameters

Structural parameters	FIML estimate		t - values	
	<u>CPI</u>	<u>WPI</u>	<u>CPI</u>	<u>WPI</u>
α	0.365	0.415	3.83	3.67
b	1.401	1.396	8.80	8.40
$c\lambda$	1.792	2.711	2.29	1.85
δ	0.737	0.901	6.44	12.64
β	0.381	0.722	7.93	8.88
γ	0.114	0.170	2.62	2.20

c) Discussion of the results

On the whole, the theoretical specifications are well validated by the empirical test. The coefficients have the expected signs and the parameters are quite significant, according to their high t-values. The R^2 for each estimated equation is also very high.

We now make a few comments on the results obtained for the different parameters:

- 1) the speed of adjustment α of the monetary adjustment equation is slightly lower for the case of CPI than for the case of WPI. Thus the time length of real balance adjustment, which is the reciprocal of the speed of adjustment, is about three years in the case of the CPI and two years and a half in the case of the WPI. Recalling that in an open economy, people adjusts to an excess supply of money by spending more on domestic goods, thus pushing up domestic prices, and on foreign goods, thus creating a balance of payments deficit,

the results obtained is not surprising. In fact, the speed of adjustment is reduced, in the case of the CPI, by the presence of government controls on the prices of first necessity goods and by the existence of non-traded goods which are more heavily weighted in the CPI than in the WPI.

- 2) The elasticity of the demand for real money balances with respect to real income, b , is roughly equal for both CPI and WPI and is significantly greater than unity. This is not surprising, for in LDCs, due to the absence of alternative financial assets, the public holds most of its savings in money form. Moreover, as savings increase more than proportionately with economic growth, it is expected that the income elasticity exceed unity.
- 3) The expectations effect $c\lambda$ is rather high for both cases, though it is higher for the WPI than for the CPI. But its statistical significance is lower for the WPI than for the CPI. Because of the impossibility to derive separate values for c and λ , we cannot exactly know whether this greater size of $c\lambda$ for the WPI is due to a higher expectations effect c of the demand for money or to a higher adjustment coefficient λ of the short run expected price level. Roughly then, we can only conclude that money holders are more sensitive to a change in the import price level, when they use the WPI than when they use the CPI.
- 4) The coefficient δ of the long run expected price level is higher for the WPI than for the CPI, and is not very far from unity in both cases. This means that the long run expected price level is equal to about three fourths of the import price level, for the CPI, and it is almost equal to the import price level, for the WPI. Taking into account the fact that the WPI includes more traded goods than the CPI, this result is very satisfying and seems to confirm our hypothesis on rational expectations.

- 5) The speed of adjustment β of the price adjustment equation is higher for the WPI than for the CPI. The same explanation as for point 1) applies here : the presence of controls on prices of first necessity (imported) goods and the proportion of non-traded goods are more important in the case of the CPI than in the case of the WPI. The time length of adjustment to import price level is about two years and a half for the CPI and one year and a half for the WPI.
- 6) Similarly the reaction coefficient γ is higher for the WPI than for the CPI, and this reflects the existence of price controls on domestic goods of first necessity in the case of the CPI. But even for the WPI, γ is low and this is probably due to the effect of excess domestic money supply on the outflow of reserves (and possibly on real output).

In fact, in section V.II. c) equations(5) - (7') have already informed us of the responsiveness of imports to domestic credit. As for the price controls, several laws on controls of prices of domestic goods were issued. In the case of imported goods, controls of prices were mainly effected with respect to first necessity goods, by the means of importations of those goods at preferred exchange rates by a government corporation, the National Marketing Corporation, which resold them below cost to retailers. The policies of price controls, in general, aim at keeping the prices of the staple goods (especially rice) at low level.

Thus, on the whole, and especially for the WPI, the price level is mainly influenced by the import price level and excess domestic credit affects more the balance of payments (and possibly real output).

V.2. The balance of payments problem

We begin this section by a quotation from an article of H.J. Johnson¹⁾ :
"To conclude that balance of payments problems are essentially monetary is not, of course, to assert that they are attributable to monetary mismanagement - they may be, or they may be the result of "real" forces in the face of which the monetary authorities play a passive role. The conclusion does mean, however, that the distinctions which have sometimes been drawn between monetary and real disequilibria, for example by concepts of "structural disequilibrium", are not logically valid, - though such concepts, carefully used, may be helpful in isolating the initiating causes of disequilibrium or the most appropriate type of remedial policy to follow."

The long run balance of payments problem is essentially a monetary phenomenon. A continuing balance of payments deficit may have a "structural" originating cause, but it is necessarily nurtured by domestic credit creation. We have already shown in section V.1.1. c) that, on one hand, the balance of payments deficit is somehow related to domestic credit through the import function (equation (5)), and, on the other hand, the government finances its past balance of payments deficit by an increase in domestic credit (equation (8)). We now turn to the analysis of "structural" causes, which may help to determine appropriate policies to solve the balance of payments problem.

The Philippines, like many other LDCs, relies on a small number of primary exports to finance its imports. The share of the four principal

1) H.G. Johnson : "Towards a General Theory of the Balance of Payments", reprinted in R.E. Caves and H.G. Johnson, ed. : Readings in International Economics (Richard D. Irwin, Homewood, Illinois, 1968), p. 378.

exports (copra and by-products, sugar, copper, abaca) in total exports has not varied to any great extent over time but has been quite stable around 80%, as is shown in Table 11. At the same time, because of the policies adopted at the beginning of the industrialization, the Philippine industry, which is concentrated in the production of the consumer goods, cannot survive without massive importations of capital goods and raw materials. In addition, the Philippine economy is heavily indebted with the foreign sector and the burden of the services of its external debt (including the remittances of earnings on foreign direct investments, which can be considered as very long term external borrowings) is a constant menace to the equilibrium of the balance of payments. Thus, for the year 1969 for example, the country's total debt maturities amounted to about \$US 600 Millions, equivalent to over one half of current account receipts of foreign exchanges; in the same year, the interests and amortizations on the external public debt with maturities of more than one year were estimated at over \$US 70 Millions, or more than 80% of merchandise export earnings.

In the face of this situation, a diversification of exports to increase the foreign exchange receipts, and a substantial mobilization of domestic savings to reduce the recourse to foreign savings are absolutely essential. With respect to the observed overuse of imported capital goods by the Philippine industrial enterprises, the reduction in the imports of capital goods can be obtained by appropriate interest and exchange rate policies and also by the adoption of "local" technologies, which use more of the existing labor surplus. These structural problems are well known and are common to other LDCs; the remedies, as stated on paper, are straightforward, but, in reality, their implementation requires a long time and a strong willingness from the government to pursue a long run policy to bring about these remedies.

As the balance of payments deficit is also the result of excess expenditure over income, the maintenance of trade controls can also reduce

national expenditures. In addition to the necessary changes in the economic structure, devaluation, with its expenditure-reducing and expenditure-switching effects, can contribute to solve part of the balance of payments problem.

During the short period of import liberalization from 1962 to 1969, the influence of devaluation and domestic credit on the balance of trade is significant. The devaluation of 1962, accompanied by measures of import liberalization, immediately improved the balance of trade in the following year 1963. In the following years, chart 7 shows that there was a reduction in the rate of domestic credit expansion in 1965, followed by a substantial increase in this rate in 1967, a slight decrease in 1968 and another increase in 1969. Consequently, the balance of trade improved in 1965-66 and the year 1967 witnessed an upsurge of imports, which continued in 1968-69. At the end of 1969, the government was forced to reintroduce measures of import restrictions. The situation of the balance of payments during these years can be seen in the following table :

The Philippine balance of payments, 1962-1969 (in Millions of \$US)

	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Current account	+29	+181	+86	+137	+161	-25	-266	-253
Goods & Services ¹⁾	-61	+102	-24	+38	+65	-211	-401	-408

V.3. Stabilization and devaluation

V.3.1. Stabilization policies

Fiscal measures and monetary policy are both used by the authorities to stabilize the economy. On the fiscal side, we have already noted the

1) Exports and imports in the balance of payments accounts are f.o.b. values.

difficulty for the government to raise new taxes (and the Congress has many a time refused to pass laws on new taxes) and the government budget is most of the time in deficit. In some years, however, efforts by the government to secure internal balance have resulted in a surplus in its budget. Thus, the surplus has amounted to 117 Millions of pesos in the fiscal year 1951/52, to 40 Millions of pesos in the fiscal year 1952/53, to 6 Millions of pesos in the fiscal year 1958/59, to 32 Millions of pesos in the fiscal year 1959/60, to 69 Millions of pesos during 1970, and to more than 2000 Millions of pesos for the recent period 1973-74 (in the context of an export boom during 1973-74).

On the monetary side, if we look at Chart 7, we see that the authorities have cut domestic credit in the periods 1958-60, 1962, 1964-65 and 1968-73. In addition, the discount rate was successively raised from 4.50% to 6.50% in 1959, from 6.00% to 7.50% in 1968 and then to 10.00% in 1970.

What can be said about the effects of these measures? As we have noted earlier, it seems that the cut in domestic credit has a strong depressive impact on real output, without bringing an immediate reduction in the inflation rate. This is particularly evident in 1960 and 1964 (see Table 17). In 1959, the combination of a budget surplus and a relatively mild reduction in domestic credit has produced a satisfactory reduction in the inflation rates, which fell to -1% for the CPI and 1% for the WPI, without a fall in output (it is worth mentioning that the domestic WPI of imported goods increased by 9% in 1959). In 1968, a policy of credit restriction has not, however, engendered an economic slump, though the inflation rates were reduced.

It is difficult to draw decisive conclusions. But, according to the results of the econometric model of section V.1.2. , domestic prices adjust rather quickly to a change in the import price and more slowly to a change of domestic credit. This means that in the context of the

Philippines, inflation is largely influenced by foreign prices and monetary policy has little effect on inflation. We shall now proceed to further investigation of the dynamic properties of our estimated simultaneous model, in order to work out the effects of domestic credit on inflation and on reserve flows.

Effects of domestic credit on inflation and reserve flows

We rewrite here the two equations of the model in their structural form :

$$\begin{aligned}\Delta m &= \alpha(m^d - m_{-1}) \\ \Delta P &= \beta(P_I - P_{-1}) + \gamma[DC - DC_{-1} - \alpha(m^d - m_{-1}) - \beta(P_I - P_{-1})]\end{aligned}$$

Let L be the lag operator, these two equations can be rewritten as :

$$\begin{aligned}[1 - (1 - \alpha)L] M &= [1 - (1 - \alpha)L] P + \alpha m^d \\ [1 - [1 - \beta(1 - \gamma) - \gamma\alpha]L] P &= \gamma\alpha LM - \gamma\alpha m^d + \gamma(1 - L)DC + \beta(1 - \gamma)PI.\end{aligned}$$

After proper substitutions, we obtain :

$$\begin{aligned}[1 - [1 - \alpha + 1 - \beta(1 - \gamma)]L + (1 - \alpha)(1 - \beta(1 - \gamma))L^2]M &= [\alpha(1 - \gamma) + [\gamma\alpha - \alpha(1 - \beta(1 - \gamma))]]L \\ m^d + [\gamma - [\gamma(1 - \alpha) + \gamma]L + \gamma(1 - \alpha)L^2]DC &+ [\beta(1 - \gamma) - \beta(1 - \gamma)(1 - \alpha)L]PI\end{aligned}$$

and

$$\begin{aligned}[1 - [1 - \alpha + 1 - \beta(1 - \gamma)]L + (1 - \alpha)(1 - \beta(1 - \gamma))L^2]P &= -\gamma(1 - L)m^d + \\ + [\gamma - [\gamma(1 - \alpha) + \gamma]L + \gamma(1 - \alpha)L^2]DC &+ [\beta(1 - \gamma) - \beta(1 - \gamma)(1 - \alpha)L]PI\end{aligned}$$

The long run equilibrium properties of the model can be shown. In the long run $L = 1$, that is all the lagged values are equal to the current values. Thus, it is found that :

- 1) In the long run, the stock of reserves in function of domestic credit is : $dR = -(1 - d)DC$.

- 2) In the long run, domestic credit has no effect on the price level.
- 3) In the long run, the price level is exactly equal to the import price level ($P = PI$).
- 4) In the long run, we also have : $M-PI = m^d$, that is $m = m^d$.

Developing further the above equations gives us the following results :

$$\begin{aligned} \{ (1+\gamma\alpha c\lambda) - [1-\beta(1-\gamma)+(1-\alpha)+\gamma\alpha c\lambda]L + [(1-\alpha)(1-\beta(1-\gamma))]L^2 \} P_t = \\ \{ [\beta(1-\gamma)+\gamma\alpha c\lambda\delta] - [\beta(1-\gamma)(1-\alpha)+\gamma\alpha c\lambda\delta]L \} PI_t + \{ \gamma - [\gamma+\gamma(1-\alpha)]L \\ + \gamma(1-\alpha)L^2 \} DC_t - \gamma\alpha b(1-L)y_t \end{aligned} \quad (1)$$

and

$$\begin{aligned} \{ (1+\gamma\alpha c\lambda) - [1-\beta(1-\gamma)+(1-\alpha)+\gamma\alpha c\lambda]L + [(1-\alpha)(1-\beta(1-\gamma))]L^2 \} M_t = \\ \{ [\beta(1-\gamma)(1+\alpha c\lambda)-\alpha c\lambda\delta(1-\gamma)] + [\alpha c\lambda\delta(1-\beta)(1-\gamma)-\beta(1-\gamma)(1-\alpha)]L \} PI_t \\ + \{ \gamma(1+\alpha c\lambda) - [\gamma(1+\alpha c\lambda)+\gamma(1-\alpha)]L + \gamma(1-\alpha)L^2 \} DC_t + \{ \alpha b(1-\gamma) - \\ \alpha b(1-\beta)(1-\gamma)L \} y_t \end{aligned} \quad (2)$$

After substituting numerical values of the different parameters into these two equations, we obtain two equations for each price index, CPI and WPI.

First for the CPI, the two (normalized) equations are :

$$(1 - 1.276 L + 0.391 L^2) P_t = (0.366 - 0.251 L) PI_t + (0.106 - 0.173 L + 0.067 L^2) DC_t - 0.054(1-L) y_t \quad (1a)$$

$$(1 - 1.276 L + 0.391 L^2) M_t = (0.122 + 0.047 L) PI_t + (0.176 - 0.109 L + 0.067 L^2) DC_t + (0.421 - 0.260 L) y_t \quad (2a)$$

For the WPI the two (normalized) equations are :

$$(1 - 0.988 L + 0.196 L^2) P_t = (0.647 - 0.438 L) PI_t + (0.143 - 0.226 L + 0.083 L^2) DC_t + 0.082 (1-L) y_t \quad (1b)$$

$$(1 - 0.988 L + 0.196 L^2) M_t = (0.363 - 0.097 L) PI_t + (0.303 - 0.220 L + 0.083 L^2) DC_t + (0.404 - 0.113 L) y_t \quad (2b)$$

From these equations we can derive the impact effects of domestic credit :

- 1) As $M = dR + (1-d)DC$, from equation (2) we can see that the impact effect of domestic credit on the stock of reserves is equal to :

$$\frac{-(1-d)(1+\gamma\alpha\lambda) + \gamma(1+\alpha\lambda)}{d(1+\gamma\alpha\lambda)}$$

is calculated from mean values and to 0.54 if it is calculated from initial values. For the CPI, the impact effect is equal to :

$$\frac{-(1-d) + 0.176}{d} \quad \text{or} \quad \frac{-0.95 + 0.176}{d} = \underline{-15.48} \quad \text{in the first case and}$$

$$(-0.54 + 0.176)/0.46 = \underline{-0.79} \quad \text{in the second case. Similarly for the}$$

$$\text{WPI, the impact effect is equal to : } (-0.95 + 0.303)/0.05 = \underline{-12.94}$$

in the first case and to $(-0.54 + 0.303)/0.46 = \underline{-0.515}$ in the second case.

- 2) The impact effect of domestic credit on the price level is given by the coefficient $\gamma/(1+\gamma\alpha\lambda)$, which is equal to 0.106 for the CPI and to 0.143 for the WPI. In any case, domestic credit has a weaker impact effect on the price level than on the stock of reserves.

To conclude this section on stabilization policies, we can say that monetary policy, even in the short run, has little effect on domestic inflation (because of reserve flows) and possibly has some effect on real output (though we cannot determine this effect from our estimated model). Consequently, special efforts must be undertaken on the fiscal side. Section IV.3.2 has earlier shown the strong relationship between taxes and GNP, but also the past incapability of the government to raise tax revenues as the economy grows. This past insufficiency of the government in raising taxes is a strong reason to make special efforts on the fiscal side, the more so as the fiscal system itself is regressive and as the income structure is characterized by a great inequality. Moreover, though the argument is not strong enough, it is worth noting that in 1959, the combination of a budget surplus and a relatively mild reduction in domestic credit succeeded in reducing the inflation rates, without reducing real output.

V.3.2. The two devaluations and their effects

On the external side, by two times, the peso was devalued to cure the balance of payments deficit; in 1970, the devaluation occurred at the same time that a complete internal stabilization program was implemented. Devaluation will affect the economy by reducing expenditures, mainly through the real balance effect, and by switching expenditures from traded to non-traded goods and channelling production towards traded goods in general, and export goods in particular. According to the monetary approach, devaluation induces a temporary improvement in the balance of payments. Some reallocation of resources will also result.

The Philippine peso was devalued the first time in 1962 by rate of approximately 70% and the second time in 1970 by about 60%. In both experiences, the balance of trade¹⁾ immediately improves, as is shown by Table 19; as an uncommon fact, the balance of trade was even in surplus in 1963. As can be seen from the table of the preceding section, the current account also improves during the period 1962-66; for the years 1970 and 1971, it amounted respectively to -48 Millions of \$US and -2 Millions of fUS.

A few remarks must be made on the improvement of the balance of trade. First, it is only temporary: in the first devaluation, it lasted two years, 1962 and 1963, and in the second devaluation, it lasted one year, 1970 (see Table 22). Secondly, though in both devaluations imports de-

1) We have deliberately chosen to consider only the balance of trade and the current account. The reason is that the capital account contains some "unexplained" movements in capital, such as short-term foreign debt contracted by the government to finance its budget deficit or the balance of payments deficit, inflow of foreign aid, outflow of long-term foreign capital etc.; we expect that these items are not responsive to devaluation. Moreover, exchange controls on capital transactions are almost permanent.

creased in the year of devaluation (by -3% in 1962 and by -4% in 1970), it seems that the surplus in 1963 was mainly due to an extraordinary increase in exports. This results partly from the fact that before the devaluation of 1962, exports were usually underscored, because of the overvaluation of the peso. Thirdly, looking at Table 18, it seems that devaluation has induced an increase in gross domestic savings. Thus, the percentage share of gross domestic savings in GNP increased by 73% in 1963 (as against 40% in 1961, 6% in 1962, 0.9% in 1964), and by 18% in 1970 (as against -7% in 1969 and 1% in 1971). To fix idea, we have also calculated the rate of change of the ratio of gross capital formation to GNP : we have found that the gross capital formation as a percentage of GNP has risen by 5% in 1963 (as against 37% in 1961, 43% in 1962 and 14% in 1964), and by 3% in 1970 (as against -7% in 1969 and -1%¹⁾ in 1971).

Therefore, one can reasonably conclude from these remarks that devaluation has induced a (temporary) reduction in the domestic absorption of goods, which has permitted a (temporary) improvement in the balance of trade.

a) The dynamics of devaluation

From the estimated model, we can derive the dynamic effects of devaluation on reserve flows and on domestic inflation. The determination of the impact dynamic multipliers for a second-order linear difference equation of the form $Y_t = aLY_t + bLY_t^2 + cX_t + dLX_t$ (where L is the lag operator) is demonstrated in Appendix III.

We shall work out these multipliers for each of the CPI and WPI cases. And first of all we must rewrite the model in appropriate forms.

-
1. In 1971, there seems to be some decumulation of stocks, since the rate of change of the ratio of gross fixed capital formation to GNP is +0.5% ; in the other years, this rate is generally lower than the rate of change of the ratio of the gross capital formation to GNP.

Table 19

Philippines : Exports and Imports

Year	Exports (Mil. \$US)	Imports (Mil. \$US) c.i.f.	Exports (Mil.Pes.)/ GNP(Mil.Pes.)	Balance of Trade (Mil. \$US)	Percent. rate of change of exports(%)	Percent. rate of change of imports(%)
1959	529.5	576.8	8.69	-47.3		
1960	560.4	662.6	9.51	-102.2	6	15
1961	499.5	677.8	9.15	-178.3	-11	2
1962	556.0	654.7	12.21	-98.7	11	-3
1963	727.1	686.9	13.45	40.2	31	5
1964	742.0	868.4	12.34	-126.4	2	26
1965	768.4	894.2	11.92	-125.8	4	3
1966	828.2	957.4	12.59	-129.2	8	7
1967	821.5	1171.6	11.51	-350.1	-0.8	22
1968	857.3	1279.6	11.18	-422.3	4	9
1969	854.3	1254.4	9.95	-399.8	-0.3	-2
1970	1061.7	1210.2	15.23	-148.5	24	-4
1971	1127.6	1330.1	14.35	-208.3	6	10
1972	1105.4	1365.8	13.16	-260.4	-2	3
1973	1787.8	1773.1	17.35	14.7	62	30

Source : International Financial Statistics

N.B. The data are not taken from the balance of payments accounts, but are given separately (lines 70..d and 71..d)

1. The CPI case

We have found earlier that the normalized equations of the nominal stock of money and the price level in terms of the exogenous variables PI , DC and y are as follows :

$$(1 - 1.276 L + 0.391 L^2) M_t = (0.122 + 0.047 L) PI_t + (0.176 - 0.243 L + 0.067 L^2) DC_t + (0.422 - 0.261 L) y_t \quad (1)$$

$$(1 - 1.276 L + 0.391 L^2) P_t = (0.365 - 0.250 L) PI_t + (0.106 - 0.173 L + 0.067 L^2) DC_t - 0.054 (1-L) y_t \quad (2)$$

Dynamic effects of devaluation on the nominal money supply and on the stock of reserves

Assuming that a change in PI_t is due only to a change in the exchange rate, the dynamic effects of devaluation on the nominal stock of money are determined by the dynamic multipliers of PI_t on M_t . The method to work out these multipliers is shown in Appendix III.

From these multipliers, we can derive the dynamic effects of devaluation on the stock of reserves by dividing the dynamic multipliers of PI_t on M_t by the weight d , which is taken as equal to 0.46

Thus a once-and-for-all increase in PI_t in time period t has the following effects on the money stock and on the stock of reserves :

$$\text{Impact effect : } \frac{\partial M_t}{\partial PI_t} = 0.122 \quad \text{and} \quad \frac{\partial R_t}{\partial PI_t} = 0.265$$

$$\text{In the second year, the effect is : } \frac{\partial M_{t+1}}{\partial PI_t} = 0.203 \quad \text{and} \quad \frac{\partial R_{t+1}}{\partial PI_t} = 0.441$$

$$\text{In the third year : } \frac{\partial M_{t+2}}{\partial PI_t} = 0.211 \quad \text{and} \quad \frac{\partial R_{t+2}}{\partial PI_t} = 0.459$$

$$\text{In the fourth year : } \frac{\partial M_{t+3}}{\partial PI_t} = 0.190 \quad \text{and} \quad \frac{\partial R_{t+3}}{\partial PI_t} = 0.413$$

$$\text{In the fifth year : } \frac{\partial M_{t+4}}{\partial PI_t} = 0.160 \quad \text{and} \quad \frac{\partial R_{t+4}}{\partial PI_t} = 0.348$$

$$\text{In the sixth year : } \frac{\partial M_{t+5}}{\partial PI_t} = 0.132 \quad \text{and} \quad \frac{\partial R_{t+5}}{\partial PI_t} = 0.287$$

The sums of the multipliers are :

$$\Sigma \frac{\partial M_{t+i}}{\partial PI_t} = 1.018 \quad \text{and} \quad \Sigma \frac{\partial R_{t+i}}{\partial PI_t} = 2.213 \quad (i = 0, 1, \dots, 5)$$

Dynamic effects of devaluation on the price level

Similar calculations are done for P_t and they yield :

$$\text{Impact effect : } \frac{\partial P_t}{\partial PI_t} = 0.366$$

$$\text{Dynamic effects : } \frac{\partial P_{t+1}}{\partial PI_t} = 0.216, \quad \frac{\partial P_{t+2}}{\partial PI_t} = 0.133, \\ \frac{\partial P_{t+3}}{\partial PI_t} = 0.085, \quad \frac{\partial P_{t+4}}{\partial PI_t} = 0.058, \quad \frac{\partial P_{t+5}}{\partial PI_t} = 0.043.$$

The sum of the multipliers is :

$$\Sigma \frac{\partial P_{t+i}}{\partial PI_t} = 0.901 \quad (i = 0, 1, \dots, 5)$$

2. The WPI case

The two equations for M_t and P_t in the WPI case are respectively :

$$(1 - 0.988 L + 0.196 L^2) M_t = (0.363 - 0.097 L) PI_t + (0.302 - 0.386 L + 0.083 L^2) DC_t + (0.405 - 0.113 L) y_t \quad (1)$$

$$(1 - 0.988 L + 0.196 L^2) P_t = (0.647 - 0.438 L) PI_t + (0.142 - 0.225 L + 0.083 L^2) DC_t - 0.082 (1-L) y_t \quad (2)$$

The dynamic effects of devaluation are shown below .

Dynamic effects of devaluation on the nominal money supply and on the stock of reserves

$$\text{Impact effect : } \frac{\partial M_t}{\partial PI_t} = 0.363 \quad \text{and} \quad \frac{\partial R_t}{\partial PI_t} = 0.789$$

$$\text{In the second year, the effect is : } \frac{\partial M_{t+1}}{\partial PI_t} = 0.262 \quad \text{and} \quad \frac{\partial R_{t+1}}{\partial PI_t} = 0.570$$

$$\text{In the third year : } \frac{\partial M_{t+2}}{\partial PI_t} = 0.188 \quad \text{and} \quad \frac{\partial R_{t+2}}{\partial PI_t} = 0.409$$

$$\text{In the fourth year : } \frac{\partial M_{t+3}}{\partial PI_t} = 0.135 \quad \text{and} \quad \frac{\partial R_{t+3}}{\partial PI_t} = 0.293$$

$$\text{In the fifth year : } \frac{\partial M_{t+4}}{\partial PI_t} = 0.098 \quad \text{and} \quad \frac{\partial R_{t+4}}{\partial PI_t} = 0.213$$

$$\text{In the sixth year : } \frac{\partial M_{t+5}}{\partial PI_t} = 0.070 \quad \text{and} \quad \frac{\partial R_{t+5}}{\partial PI_t} = 0.152$$

The sums of the multipliers are :

$$\Sigma \frac{\partial M_{t+i}}{\partial PI_t} = 1.116 \quad \text{and} \quad \Sigma \frac{\partial R_{t+i}}{\partial PI_t} = 2.426 \quad (i = 0, 1, \dots, 5)$$

Dynamic effects of devaluation on the price level

$$\text{Impact effect : } \frac{\partial P_t}{\partial PI_t} = 0.647$$

$$\begin{aligned} \text{Dynamic effects : } \quad & \frac{\partial P_{t+1}}{\partial PI_t} = 0.201, \quad \frac{\partial P_{t+2}}{\partial PI_t} = 0.072, \\ & \frac{\partial P_{t+3}}{\partial PI_t} = 0.032, \quad \frac{\partial P_{t+4}}{\partial PI_t} = 0.019, \quad \frac{\partial P_{t+5}}{\partial PI_t} = 0.014 \end{aligned}$$

The sum of the multipliers is :

$$\Sigma \frac{\partial P_{t+i}}{\partial PI_t} = 0.985 \quad (i = 0, 1, \dots, 5)$$

Comparing the results obtained for the CPI and WPI, it can be seen that the impact effect of devaluation is always stronger for the WPI than for the CPI. Moreover, the stock of reserves takes more time to adjust in the case of the CPI than in the case of the WPI, since the multiplier approaches zero in a longer period of time in the former case than in the latter case. In the long run, the multiplier of PI_t on P_t must be unity and this can be shown by summing up all the dynamic multipliers. Over a period of six years this sum approaches unity and it is greater for the WPI than for the CPI, which implies that the WPI adjusts more rapidly than the CPI.

These dynamic multipliers can be summarized in the time paths contained in the graph which is drawn below. It is worth mentioning that at the end of the first chapter, Charts 1a and 2a have shown a deterioration of the balance of payments during the first and second months following devaluation. The yearly data do not show such a deterioration.

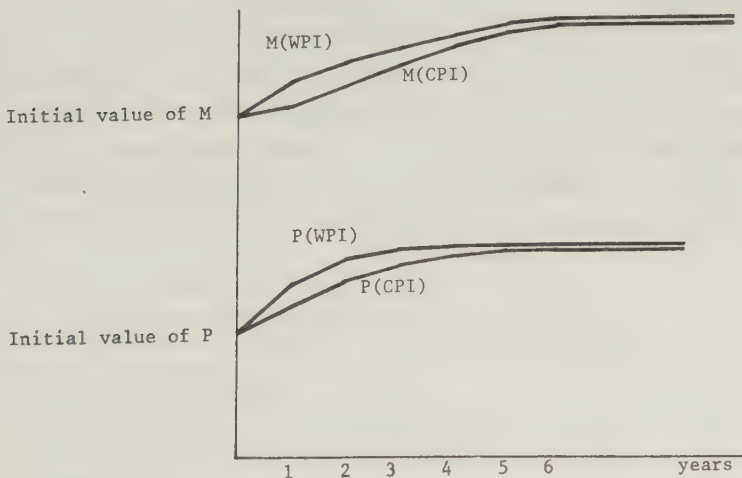


FIGURE 7

The shape of the time paths clearly corresponds to the time paths No.2 in the theoretical analysis. The parallelism between the time paths is also empirically validated. Thus, these results are rather satisfactory, insofar as they confirm our theoretical predictions.

b) Devaluation and resource allocation

The production sector also adjusts to devaluation. The figures in Table 19 on the percentage share of exports in GNP enlighten somewhat the problem of the reallocation of resources : the share of exports increases by 33% in 1962 (as against -4% in 1961) and by 53% in 1970 (as against -11% in 1969). The Economic Survey of Asia and the Far East of 1968 has reported that devaluation has induced an increase in the production of coconut, which is an export crop : between 1949 and 1959, the number of bearing and non-bearing trees grew at annual rates of 1.5% and 0.8% respectively; but from 1960 to 1965, the rates were 7.3% and 7.6%.

Of equal importance is the shift in the use of factors of production brought about by devaluation. In this respect, three very interesting studies¹⁾ were done. The first is of Williamson, whose purpose is to estimate the substitution elasticity of the CES production function and the lag in the adjustment of input mix; the second study, effected

1) Jeffrey G. Williamson : "Relative Price Changes, Adjustment Dynamics and Productivity Growth : The Case of Philippine Manufacturing", Economic Development and Cultural Change, Vol. 19, July 1971, p. 507-526; R.M. Bautista and G.M. Jurado : "Employment Effect of Currency Overvaluation : a Preliminary Note on the Philippines", Economic Bulletin for Asia and the Far East, Vol. 23, September 1972, p. 44-46; R.M. Bautista : "Anatomy of Labour Absorption in Philippine Manufacturing, 1956-66", Economic Bulletin for Asia and the Far East, Vol. 24, September/December 1973, p. 12-22.

by Bautista and Jurado, aims at determining the influence of the over-valuation of the peso on the use of capital by Philippine industry; and the third study, of Bautista, analyzes the effect of devaluation on the structure of Philippine industry and on the use of capital and labor in the production process. We shall give here a brief summary of their findings.

Williamson assumes that the production structure in Philippine Manufacturing can be represented by a CES production function which has the form :

$$Q = G(\delta K^{-\rho} + (1 - \delta)L^{-\rho})^{-1/\rho}$$

where : Q = output

G = efficiency parameter

δ = distribution parameter or degree to which the technology is capital-intensive

ρ = substitution parameter

The optimum input mix is given by :

$$\left(\frac{L}{K}\right)^* = \left(\frac{P_K}{P_L}\right)^{1/(1+\rho)} \left(\frac{\delta}{1-\delta}\right)^{1/(1+\rho)}$$

where : P_K = price of capital

P_L = price of labor

The elasticity of substitution is :

$$b = \frac{\delta(K/L)}{\delta(P_L/P_K)} \bigg/ \frac{K/L}{P_L/P_K} = \frac{1}{1+\rho}$$

Williamson further assumes that a change in factor input levels involves costs, with the consequence that firms adjust slowly their input

mix to a change in the relative price of inputs. The lag in the adjustment is given by the adaptive formulation :

$$\frac{(L/K)_t}{(L/K)_{t-1}} = \left[\frac{(L/K)^*_t}{(L/K)_{t-1}} \right]^\epsilon, \quad 0 < \epsilon < 1$$

where : ϵ = speed of adjustment

Williamson has found a high elasticity of substitution for Philippine manufacturing, exceeding unity, and a low value for ϵ (averaging around .15). This means that the Philippine firms are highly responsive to relative prices of factor inputs, which explains the earlier noted bias towards the use of capital, owing to the low cost of capital, which results from the overvaluation of the peso, whereby the prices of imported capital goods are lowered, and from the low interest rate policy of the government. The low speed of adjustment is the result of high costs of adjustment, which, as suggested by Williamson, in conjunction with low interest rates, induce a hoarding of capital by the firms.

Bautista and Furado also started from the CES function to find the optimum labor-capital ratio, which is obtained, in addition, by an upward readjustment of the cost of capital. They have estimated that for the year 1961, the peso was overvalued by 70%¹⁾, thus cheapening the cost of imported capital. The cheapening of capital has then created a capital-intensive bias, at the expense of labor employment.

And finally, Bautista has analyzed the effect of devaluation on the "labour-use coefficient", which is defined as the number of workers employed per unit of value added in the industry. His study bears on

1) in 1962, the Peso was devalued by about 70%.

the comparison between two size classes of establishments, the large and the small establishments, and between two periods, the first period, 1956-61, being characterized by widespread import and foreign exchange controls, tax exemption, subsidies and low interest rates to foster industrialization, and the second period, 1960-66, being marked by decontrol measures and devaluation, (protection being provided by the tariff structure).

Bautista has found that the large establishments are more than three times less labour-using than the small establishments in the same industry. Although the average annual growth rate of real value added for all the manufacturing sector in the second period 1960-66 is less than that of the first period 1956-62, with respectively 6.16% against 8.32%, the post-control period shows an overall improvement in the growth of value added in the small establishments, the opposite being the case for the large establishments.

Let n , v , c denote proportionate increases in employment, value added (in real terms) and labour-use coefficient. Then it can be written: $n = v + c$. Employment generation is therefore given by: $nN = vN + cN$, where N is total level of employment in the base period. Hence, the increase in employment is due, either to the growth of output (vN), or to technical change (cN), technical change, here, being taken in the sense of increases in the labour-use coefficient. By comparing the changes occurred in the two periods, it appears that :

- 1) The average annual employment decreases in the post-control for large establishments, while it substantially increases in the same period for small establishments. However, total labour absorption decreased slightly, on account of the much greater share of the large establishments in organized manufacturing.
- 2) The overall growth in real value added has significantly contributed

to the total increase in employment in both classes of establishments in both periods, (in comparison with the other source of employment, which is technical change). In the case of large establishments, this source of employment generation decreased substantially in the post-control period, while it increased more than threefold in the same period for the small establishments.

- 3) On the whole, the technical changes have the effect of lowering employment in the large establishments and raising it in the small establishments during both periods, with a relative improvement in each size class during the post-control period.

The study of Bautista has, therefore, shown that decontrol and devaluation work in favor of the small establishments, which are more labour-using than the large establishments, and in favor of a greater use of labour in all the manufacturing sector.

CONCLUSION

This study has reasserted the role of money in the process of inflation and in the continuation of balance of payments disequilibrium. However, if inflation and chronic balance of payments problems are essentially monetary phenomena, the originating causes must not necessarily be exclusively monetary; structural factors may be the generating sources, with money serving as a vehicle. Structural factors stem from the structure of a particular economy. In fact in less developed countries they result from the tendency for expenditures to exceed income, in the face of the constraints of limited foreign exchange receipts, of limited fiscal receipts, and of limited domestic savings. The examination of the Philippine case has brought a strong support to these views.

In addition, a small open economy, in a regime of fixed exchange rate, is subjected to a limited freedom in the conduct of its economic policies and its rate of inflation will tend, in the long run, towards the world rate of inflation. This interdependence with the rest of the world adds another difficulty to stabilization policies. In a regime of flexible exchange rates, a small country can have some economic autonomy, although the existing organization of exchange markets in LDCs is not efficient enough to allow a freely fluctuating exchange system.

In both regime of exchange rates, the case is strong for a moderate expansion of the money supply, otherwise foreign exchange reserves will be depleted or the country will be plagued by an excessively high rate of inflation.

Identifying inflation and balance of payments deficit as essentially monetary phenomena leads to the adoption of monetary solutions to solve these problems, that is a restraint in domestic credit creation and a devaluation of the exchange rate. However, if monetary solutions are necessary, the neglect of structural changes can be an obstacle to their success, insofar as the structural problems may be the originating causes of excess domestic credit creation. The structural changes are brought about by the effort to equilibrate expenditures with savings, by mobilizing domestic savings, by improving the fiscal system to permit an increase in fiscal receipts, by an inflow of foreign savings (foreign aid and limited capital investment), by restructuring the export sector to increase foreign exchange receipts, by restricting expenditures through import restrictions and through restrictions on some domestic expenditures (on luxury goods, for example), etc.; the structural changes are also brought about by the effort to improve the efficiency of the economic organization, to increase the productivity of labor and capital. Without the implementation of these structural changes, monetary restraint and devaluation have only a temporary success, for the persistence of structural problems carries with it the risk of excess credit creation.

APPENDIX I

SHORT RUN, LONG RUN "MULTIPLIERS" AND TIME PATH OF

CONTINUOUS DYNAMIC EQUATIONS

Let y be the endogenous variable and x the exogenous variable. Given the operators $D = \frac{d}{dt}$ and $D^{-1} = \int dt$, a second order differential equation of the form

$$D^2 y + a Dy + by = (cD + d)x \quad (1)$$

can be rewritten in terms of its roots $-r_1$ and $-r_2$ (which are both negative) and in terms of deviations from initial positions, $\bar{y}$ and $\bar{x}$ (where $\bar{y} = y - y_0$ and $\bar{x} = x - x_0$) :

$$(D + r_1)(D + r_2)\bar{y} = (cD + d)\bar{x}$$

The steady state solution is obtained by setting $D = 0$. It is :

$$\bar{y}^* = \frac{d}{b} \bar{x}$$

Hence : $D\bar{y}^* = 0$.

If x deviates from its initial position by a discrete change, $\bar{x}$ can be removed from any integrand term. Hence the particular integral of equation (1) is :

$$\bar{y} = \left[c(N_1 e^{-r_1 t} + N_2 e^{-r_2 t}) + d\left(-\frac{N_1}{r_1} e^{-r_1 t} - \frac{N_2}{r_2} e^{-r_2 t}\right) \right] \bar{x}$$

where : $N_1 = -\frac{1}{r_1 - r_2}$ and $N_2 = \frac{1}{r_1 - r_2}$

Assuming that initially y was at its equilibrium position y_0 , the time path of $\bar{y}$ after a change in $\bar{x}$ is given by :

$$\bar{y} = [c(N_1 e^{-r_1 t} + N_2 e^{-r_2 t}) + d(-\frac{N_1}{r_1} e^{-r_1 t} - \frac{N_2}{r_2} e^{-r_2 t})] \bar{x} + \frac{d}{b} \bar{x} \quad (2)$$

The short run "multiplier" is derived from the differentiation of $\bar{y}$ with respect to time and from the assumption that $t \rightarrow 0$.

Differentiating equation (2) gives :

$$\bar{Dy} = [c(-r_1 N_1 e^{-r_1 t} - r_2 N_2 e^{-r_2 t}) + d(N_1 e^{-r_1 t} + N_2 e^{-r_2 t})] \bar{x} \quad (3)$$

As $t \rightarrow 0$:

$$\bar{Dy} = [c(-r_1 N_1 - r_2 N_2) + d(N_1 + N_2)] \bar{x} = c\bar{x} \quad (4)$$

In the long run, that is when $t \rightarrow \infty$, then $\bar{Dy} \rightarrow 0$ and we only have the steady state solution :

$$\bar{y}^* = \frac{d}{b} \bar{x}$$

Turning points of the time path.

We first rewrite equation (3) :

$$\begin{aligned} \bar{Dy} &= [N_1 e^{-r_1 t} (d - r_1 c) + N_2 e^{-r_2 t} (d - r_2 c)] \bar{x} \\ \bar{Dy} &= \frac{1}{r_1 - r_2} \cdot [(d - r_2 c) e^{-r_2 t} - (d - r_1 c) e^{-r_1 t}] \bar{x} \end{aligned} \quad (3')$$

It is now assumed that $|r_1| > |r_2|$.

The turning point is determined by setting $\bar{Dy} = 0$. Two special cases occur : $\bar{Dy} = 0$ when $t \rightarrow \infty$ and when $r_1 = r_2$. In the case where $r_1 = r_2$, $\bar{y}$ instantaneously jumps to its steady state level after a shock in the exogenous variable $\bar{x}$.

$\bar{Dy} = 0$ also when the expression between the parentheses is equal to zero :

$$[(d - r_2 c) e^{-r_2 t} - (d - r_1 c) e^{-r_1 t}] = 0$$

We must distinguish between two cases : 1) the case where $\bar{Dy} > 0$ before the turning point (and hence c , which determines the short run multiplier, is positive) ; 2) the case where $\bar{Dy} < 0$ before the turning point (and hence $c < 0$).

1. $\bar{Dy} > 0$ and $c > 0$.

It can be shown that the existence of a turning point and the condition that $\bar{Dy} > 0$ before the turning point imply that $r_1 c > d$ and $r_2 c > d$. Thus the expressions $(r_1 c - d)$ and $(r_2 c - d)$ are positive and equation (3') can be rearranged as follows :

$$\bar{Dy} = \frac{1}{r_1 - r_2} [(r_1 c - d) e^{-r_1 t} - (r_2 c - d) e^{-r_2 t}] \bar{x} \quad (3'')$$

$\bar{Dy} = 0$ when

$$(r_1 c - d) e^{-r_1 t} = (r_2 c - d) e^{-r_2 t}$$

Taking logarithms of both sides yields :

$$\ln(r_1 c - d) - r_1 t = \ln(r_2 c - d) - r_2 t$$

$$\text{or } t(r_1 - r_2) = \ln(r_1 c - d) - \ln(r_2 c - d)$$

Thus $\bar{Dy} = 0$ at time t^* , where :

$$t^* = \frac{1}{r_1 - r_2} [\ln(r_1 c - d) - \ln(r_2 c - d)] \quad (5)$$

This gives us the proof that a turning point exists.

From equation (3''), we can easily check that when $t < t^*$, $\bar{Dy} > 0$, and when $t > t^*$, $\bar{Dy} < 0$.

Returning to equation (5), it is found that when c is negligible, the expressions $(r_1 c - d)$ and $(r_2 c - d)$ are negative and hence no solution exists for t^* . It follows that when c is negligible (but still positive), there is no turning point.

2. $\bar{Dy} < 0$ and $c < 0$.

Then equation (3') becomes :

$$\bar{Dy} = \frac{1}{r_1 - r_2} [(r_2 c + d) e^{-r_2 t} - (r_1 c + d) e^{-r_1 t}] \bar{x} \quad (3''')$$

$\bar{Dy} = 0$ when

$$(r_2 c + d) e^{-r_2 t} = (r_1 c + d) e^{-r_1 t}$$

Taking logarithms of both sides yields :

$$\ln(r_2 c + d) - r_2 t = \ln(r_1 c + d) - r_1 t$$

$$\text{or } t(r_1 - r_2) = \ln(r_1 c + d) - \ln(r_2 c + d)$$

Thus $\bar{Dy} = 0$ at time t^* , where :

$$t^* = \frac{1}{r_1 - r_2} [\ln(r_1 c + d) - \ln(r_2 c + d)] \quad (6)$$

This gives us the proof that a turning point exists.

From equation (3'''), we can easily check that when $t < t^*$, $\bar{Dy} < 0$ and when $t > t^*$, $\bar{Dy} > 0$.

Overshooting of the steady state solution.

We are also interested in finding out the case where $\bar{y}$ overshoots its long run level $\bar{y}^*$.

1. $c > 0$.

Rewriting equation (2), we have :

$$\bar{y} = \frac{1}{r_1 - r_2} \left[\left(\frac{r_2 c - d}{r_2} \right) e^{-r_2 t} - \left(\frac{r_1 c - d}{r_1} \right) e^{-r_1 t} \right] \bar{x} + \frac{d}{b} \bar{x} \quad (2')$$

We first note that at time $t = 0$:

$$\bar{y} = -\frac{d}{r_1 r_2} \bar{x} + \frac{d}{b} \bar{x}$$

That is, at time $t = 0$, $\bar{y} < \bar{y}^*$ (since $\bar{y} = \bar{y}^* - \frac{d}{r_1 r_2} \bar{x}$)

$\bar{y}$ will overshoot its long run level when $\bar{y} > \bar{y}^*$. We can find the time t_1 when $\bar{y}$ attains its long run level $\bar{y}^*$ before it overshoots it, by stating $\bar{y} - \bar{y}^* = 0$, or from equation (2') :

$$\left(\frac{r_2 c - d}{r_2} \right) e^{-r_2 t} = \left(\frac{r_1 c - d}{r_1} \right) e^{-r_1 t}$$

Taking logarithms of both sides yields :

$$t(r_1 - r_2) = \ln \frac{r_1 c - d}{r_1} - \ln \frac{r_2 c - d}{r_2}$$

Thus t_1 is found to be :

$$t_1 = \frac{1}{r_1 - r_2} [\ln(r_1 c - d) - \ln(r_2 c - d) - (\ln r_1 - \ln r_2)] \quad (7)$$

Comparing equations (5) and (7), it can be easily seen that $t_1 < t^*$.

It follows that $\bar{y}$ overshoots its long run level before it attains its turning point.

In the case where $c > 0$ but is negligible, no solution exists for t_1 (since the logarithm of a negative value does not exist).

2. $c < 0$.

Equation (2), then, becomes :

$$\bar{y} = \frac{1}{r_1 - r_2} \left[\left(\frac{-r_2 c - d}{r_2} \right) e^{-r_2 t} - \left(\frac{-r_1 c - d}{r_1} \right) e^{-r_1 t} \right] \bar{x} + \frac{d}{b} \bar{x} \quad (2'')$$

At time $t = 0$ $\bar{y}$ is also equal to :

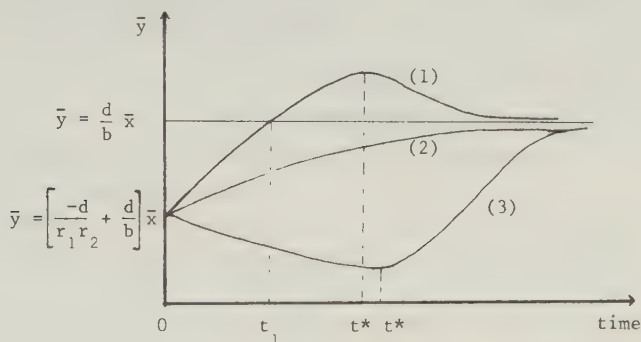
$$\bar{y} = -\frac{d}{r_1 r_2} \bar{x} + \frac{d}{b} \bar{x}$$

and hence, $\bar{y} < \bar{y}^*$ at time $t = 0$.

Now we can see at once that $\left(\frac{-r_1 c - d}{r_1} \right)$ and $\left(\frac{-r_2 c - d}{r_2} \right)$ are negative.

To find out the time t_1 , where $\bar{y} = \bar{y}^*$, we have to take logarithms of these two magnitudes. As logarithms of negative values do not exist, we can already say that no solution exists for t_1 when $c < 0$.

The three possible time paths can be drawn as follows :



Assuming that at time $t = 0$, x deviates from its initial position by a discrete change $\bar{x}$ ($\bar{x} = x - x_0$), the time path that $\bar{y}$ will follow after this discrete change in x are depicted in the above figure.

Time path (1) corresponds to the case where $c > 0$, time path (2) to the case where $c > 0$ but is negligible, and time path (3) to the case where $c < 0$.

APPENDIX II

DATA DESCRIPTION

In the estimation of the econometric model of inflation in the Philippines, we have used the following data.

1. Data from the International Financial Statistics (International Monetary Fund) :

m = Nominal money stock / Price level

The nominal money stock (M) is defined as :

$$M = \text{Money} + \text{Quasi Money} + \text{Other items} = \text{Net Foreign Assets} + \text{Domestic credit}$$

y = Nominal national income / Price level

DC = Domestic credit of the banking system.

2. Data from the Monthly Bulletin of Statistics (United Nations) :

P = Price level (Consumer Price Index or General Wholesale Price Index)

PI = Wholesale Price Index of Imports.

The period covered by the estimation is 1950 - 73.

APPENDIX III

SHORT RUN AND LONG RUN MULTIPLIERS OF A

DISCRETE DYNAMIC EQUATION

Let Y be the endogenous variable of a second order linear difference equation, X the exogenous variable and L a lag operator (such that $LY_t = Y_{t-1}$, $L^2Y_t = Y_{t-2}$, etc.).

The second-order linear difference equation is of the form :

$$Y_t = a Y_{t-1} + b Y_{t-2} + c X_t + d X_{t-1} \quad (1)$$

or :

$$Y_t = a LY_t + b L^2Y_t + c X_t + d LX_t$$

The steady-state.

It is assumed that an equilibrium solution exists and it is stable.

Furthermore, the steady state is characterized by two conditions :

$$1) Y_t = Y_{t-1} = Y_{t-2}$$

$$2) X_t = X_{t-1}$$

Therefore, in the steady state :

$$Y_t = \frac{c + d}{1 - a - b} X_t$$

The impact multiplier.

The impact multiplier represents the effect of a unit change of X_t

Ignoring all X terms except X_t , we find that :

$$\frac{\delta Y_{t+1}}{\delta X_t} = ac + d$$

Similarly the dynamic multipliers in time periods $t+2$, $t+3$, ... are found to be :

$$\frac{\delta Y_{t+2}}{\delta X_t} = a(ac + d) + bc$$

$$\frac{\delta Y_{t+3}}{\delta X_t} = a^2(ac + d) + 2abc + bd$$

$$\frac{\delta Y_{t+4}}{\delta X_t} = a^3(ac + d) + 3a^2bc + 2abd + b^2c$$

$$\frac{\delta Y_{t+5}}{\delta X_t} = a^4(ac + d) + 4a^3bc + 3a^2bd + 3ab^2c + b^2d$$

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